SLC™ Console Manager
User Guide

- SLC8
- SLC16
- SLC32
- SLC48

Part Number 900-449
Revision J July 2014

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Revision History

Date	Rev.	Comments
June 2006	A	Initial Release
August 2006	B	Added event configuration, local/remote user authentication precedence, firmware update via HTTPS, complex passwords, and port permissions for remote users.
January 2007	C	Added dial-in & dial-on-demand modem state, IP filters, active directory to LDAP section, and additional TACACS+ servers.
April 2007	D	Added ability to import site-specific SSL certificates and SSH host keys, to display a list of web sessions, to set an IP filter timer, and to save system logs across reboots. Enabled dual boot-up.
August 2007	E	Added gateway page, phone home; alarm delay; SSH v1 logins; trap community; configuration manage option; system logs beginning and end dates, device port logging to syslog.
April 2008	F	New web page design with tabbed menus. Added support for the following: Sensorsoft devices; SecureID over Radius; command and status of the SLP expansion chassis; escape and break sequences for remote users; password aging, iGoogle Gadget; SNMP v3 encryption; ability to copy boot bank; host lists for outgoing modem and direct connection at the CLI; new option for local users to display a custom menu at login.

Date (continued)	Rev.	Comments
January 2010	G	Added support for Interface and Batch Scripting, Ethernet Bonding, configurable LCD screens and scrolling, redesigned SLC Network web page, Email Log, Firmware Update vi PC Card and NFS, SLC Temperature, and PPP dialback (including CallBack Control Protocol).
March 2010	H	Updated for USB support that was added in firmware 5.5.
November 2013	I	Updated product name and trademark information.
July 2014	J	Updated to firmware release 6.1.0.0.

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1: *About This Guide*

This guide provides the information needed to install, configure, and use the products in the Lantronix® SLC™ console manager family. It is for IT professionals who must remotely and securely configure and administer servers, routers, switches, telephone equipment, or other devices equipped with a serial port.

Note: *The features and functionality described in this document specific to PC Card use are supported on SLC-02 part numbers. The features and functionality specific to USB port use are supported on SLC-03 part numbers.*

This chapter contains the following sections:

- *Chapter Summaries*
- *Conventions*
- *Additional Documentation*

Chapter Summaries

Table 1-1 lists and summarizes each chapter and appendix.

Table 1-1Chapter/Appendix and Summary

Chapter/Appendix	Summary
Chapter 2: Overview	Describes the SLC models, main features, and supported protocols.
Chapter 3: Installation	Provides technical specifications; describes connection formats and power supplies; provides instructions for installing the unit in a rack.
Chapter 4: Quick Setup	Provides instructions for getting your unit up and running and for configuring required settings.
Chapter 5: Web and Command Line Interfaces	Describes the web and command line interfaces available for configuring the unit. ***Note:*** *Chapters 7: Services, 8: Devices, 9: PC Cards, 10: USB Port, 11: Connections, and 12: User Authentication provide detailed instructions for using the web interface and include command line interface commands.*
Chapter 6: Basic Parameters	Provides instructions for configuring network ports, firewall and routing settings, and date and time.
Chapter 7: Services	Provides instructions for enabling and disabling system logging, SSH and Telnet logins, SNMP, SMTP, and the date and time.
Chapter 8: Device Ports	Provides instructions for configuring global device port settings, individual device port settings, and console port settings.
Chapter 9: PC Cards	Provides instructions for configuring storage (Compact Flash) and modem/ISDN PC cards.

Table 1-1Chapter/Appendix and Summary (continued)

Chapter/Appendix	Summary
Chapter 10: USB Port	Provides instructions for configuring USB storage devices (thumb drive) or USB modems.
Chapter 11: Connections	Provides instructions for configuring connections and viewing, updating, or disconnecting a connection.
Chapter 12: User Authentication	Provides instructions for enabling or disabling methods that authenticate users who attempt to log in via SSH, Telnet, or the console port. Provides instructions for creating custom menus.
Chapter 13: Maintenance	Provides instructions for upgrading firmware, viewing system logs and diagnostics, generating reports, and defining events. Includes information about web pages and commands used to shut down and reboot the SLC console manager.
Chapter 14: Application Examples	Shows how to set up and use the SLC device in three different configurations.
Chapter 15: Command Reference	Lists and describes all of the commands available on the SLC command line interface
Appendix A: Bootloader	Lists and describes the commands available for the bootloader command line interface.
Appendix B: Security Considerations	Provides tips for enhancing SLC security.
Appendix C: Safety Information	Lists safety precautions for using the SLC console manager.
Appendix D: Sicherheitshinweise	Lists safety precautions for using the SLC device in German.
Appendix E: Adapters and Pinouts	Includes adapter pinout diagrams.
Appendix F: Protocol Glossary	Lists the protocols supported by the SLC console manager with brief descriptions.
Appendix G: Compliance Information	Provides information about the SLC compliance with industry standards.
Appendix H: DC Connector Instructions	Provides -48VDC plug connector instructions for the SLC console manager.
Appendix I: LDAP Schemas	Provides information about configuring LDAP schemas in Windows active directory.

Conventions

Table 1-2 lists and describes the conventions used in this book.

Table 1-2 Conventions Used in This Book

Convention	Description
Bold text	Default parameters.
Brackets [ ]	Optional parameters.
Angle Brackets < >	Possible values for parameters.
Pipe |	Choice of parameters.
Warning	***Warning: Means that you are in a situation that could cause equipment damage or bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.***
Note	*Note: Means take notice. Notes contain helpful suggestions, information, or references to material not covered in the publication.*
Caution	***Caution: Means you might do something that could result in faulty equipment operation, or loss of data.***
Screen Font (Courier New)	CLI terminal sessions and examples of CLI input.

Additional Documentation

Visit the Lantronix web site at www.lantronix.com/support/documentation for the latest documentation and the following additional documentation:

- ***SLC Console Manager Quick Start***—Describes the steps for getting the SLC console manager up and running.
- ***SLC Console Manager Online Help for the Command Line Interface***—Provides online help for configuring the SLC console manager using commands.
- ***SLB and SLC Online Help for the Web Interface***—Provides online help for configuring the SLC console manager using the web page.
- ***Detector™ Online Help***—Provides online help for assigning a static IP address to the SLC console manager using the Lantronix® Detector™ tool.

2: Overview

SLC console managers are members of a secure IT management family of products. These products offer systems administrators and other IT professionals a variety of tools to securely access and manage their resources. Lantronix has been an innovator in this market with terminal servers and secure console servers, as well as other remote access devices. The SLC console managers build on that foundation and offer new features and capabilities.

IT equipment can be configured, administered, and managed in a variety of ways, but most devices have one method in common: an RS-232 serial port, sometimes called a console, auxiliary, or management port. These ports are often accessed directly by connecting a terminal or laptop to them, meaning that the administrator must be in the same physical location as the equipment. SLC console managers give the administrator a way to access them remotely from anywhere there is a network or modem connection.

Many types of equipment can be accessed and administered using Console Managers including:

- **Servers:** Unix, Linux, Windows 2003, and others.
- **Networking equipment:** Routers, switches, storage networking.
- **Telecom:** PBX, voice switches.
- **Other systems with serial interfaces:** Heating/cooling systems, security/building access systems, UPS, medial devices.

The key benefits of using Console Managers:

- **Saves money:** Enables remote management and troubleshooting without sending a technician onsite. Reduces travel costs and downtime costs.
- **Saves time:** Provides instant access and reduces response time, improving efficiency.
- **Simplifies access:** Enables you to access equipment securely and remotely after hours and on weekends and holidays—without having to schedule visits or arrange for off-hour access.
- **Protects assets:** Security features provide encryption, authentication, authorization, and firewall features to protect your IT infrastructure while providing flexible remote access.

SLC console servers provide features such as convenient text menu systems, break-safe operation, port buffering (logging), remote authentication, and Secure Shell (SSH) access. Dial-up modem support ensures access when the network is not available.

This chapter contains the following sections:

- *SLC Models and Part Numbers*
- *System Features*
- *Hardware Features*

SLC Models and Part Numbers

The SLC models offer a compact solution for remote and local management of up to 48 devices, for example, servers, routers, and switches with RS-232C (now EIA-232) compatible serial consoles in a 1U-tall rack space. All models have two Ethernet ports called Eth1 and Eth2 in this document. There are two groups of models with different part numbers - one group of models with a USB port (part number -03) and one group of models with PC Card slots (part number -02).

Two Ethernet ports are useful when you want to use one port on a private, secure network and the other on a public, unsecured network.

Table 2-1 lists the part numbers, models, and descriptions.

Table 2-1 SLC Part Numbers, Models, and Descriptions

Part Number USB	Part Number PC Card Slots	Model and Description
SLC00812N-03	**SLC00812N-02**	**SLC8:** 8 port, Single AC Supply Secure Console Manager
SLC01612N-03	**SLC01612N-02**	**SLC16:** 16 Port, Single AC Supply Secure Console Manager
SLC03212N-03	**SLC03212N-02**	**SLC32:** 32 Port, Single AC Supply Secure Console Manager
SLC04812N-03	**SLC04812N-02**	**SLC48:** 48 Port, Single AC Supply Secure Console Manager
SLC00822N-03	**SLC00822N-02**	**SLC8**: 8 Port, Dual AC Supply Secure Console Manager
SLC01622N-03	**SLC01622N-02**	**SLC16:** 16 Port, Dual AC Supply Secure Console Manager
SLC03222N-03	**SLC03222N-02**	**SLC32:** 32 Port, Dual AC Supply Secure Console Manager
SLC04822N-03	**SLC04822N-02**	**SLC48:** 48 Port, Dual AC Supply Secure Console Manager
SLC00824N-03	**SLC00824N-02**	**SLC8:** 8 Port, Dual DC Supply Secure Console Manager
SLC01624N-03	**SLC01624N-02**	**SLC16:** 16 Port, Dual DC Supply Secure Console Manager
SLC03224N-03	**SLC03224N-02**	**SLC32:** 32 Port, Dual DC Supply Secure Console Manager
SLC04824N-03	**SLC04824N-02**	**SLC48:** 48 Port, Dual DC Supply Secure Console Manager

The products differ in the number of device ports provided, USB port or PC Card slots, and AC or DC power availability. Some models have dual entry redundant power supplies for mission critical applications. These models are available in AC or DC powered versions. *Figure 2-2* depicts the SLC48 console manager with PC Card slot (a part number -02) and *Figure 2-3* depicts the SLC48 console manager with USB port (a part number -03).

Figure 2-2 Lantronix SLC48 Console Manager with PC Card Slots

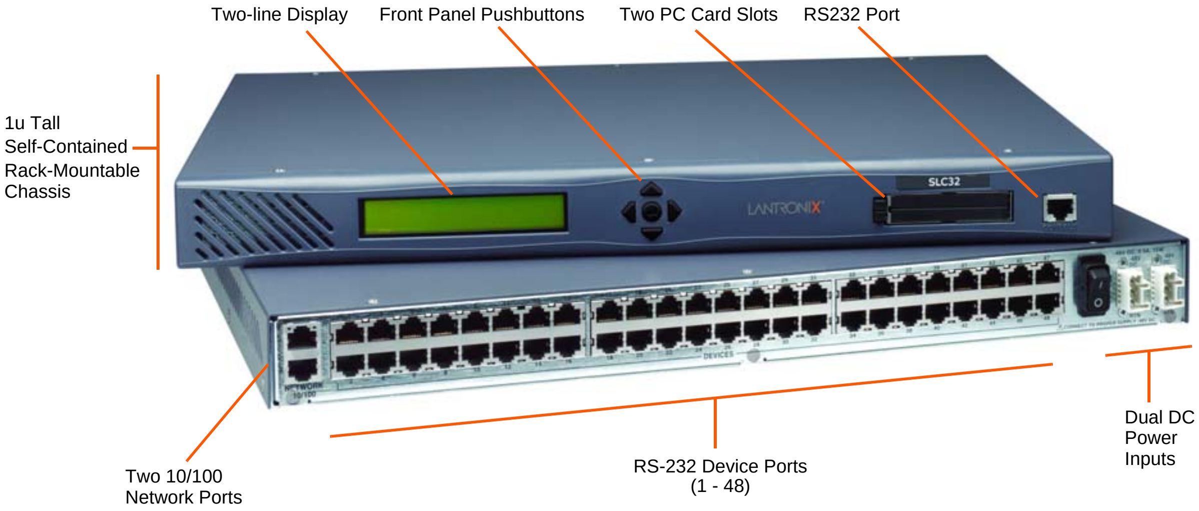
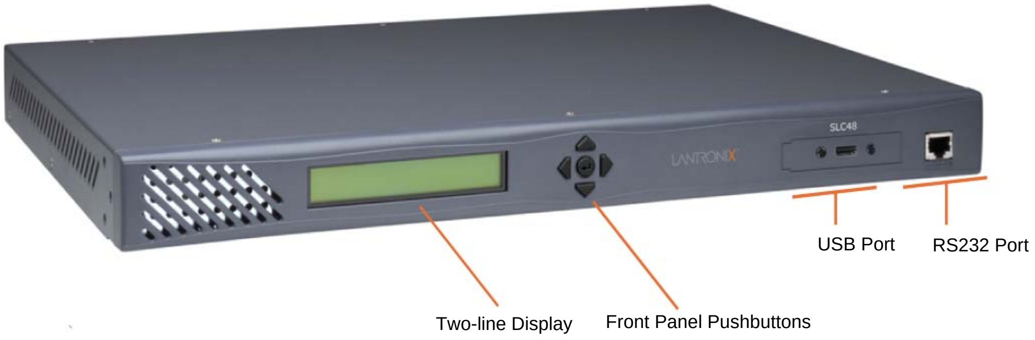


Figure 2-3 Lantronix SLC48 Console Manager with USB Port



System Features

The SLC console manager has the following capabilities:

- Connects up to 48 RS-232 serial consoles
- 10Base-T/100Base-TX Ethernet network compatibility
- Buffer logging to file
- Email and SNMP notification
- ID/Password security, configurable access rights
- Secure shell (SSH) security; supports numerous other security protocols
- Network File System (NFS) and Common Internet File System (CIFS) support
- Telnet or SSH to a serial port by IP address per port or by IP address and TCP port number

- Configurable user rights for local and remotely authenticated users
- Supports an internal PC Card modem, USB modem, or an external modem
- No unintentional break ever sent to attached servers (Solaris Ready)
- Simultaneous access on the same port - “listen” and “direct” connect mode
- Local access through a console port
- Web administration (using most browsers)

Protocols Supported

The SLC console manager supports the TCP/IP network protocol as well as:

- SSH, Telnet, PPP, NFS, and CIFS for connections in and out of the SLC console manager
- SMTP for mail transfer
- DNS for text-to-IP address name resolution
- SNMP for remote monitoring and management
- FTP and SFTP for file transfers and firmware upgrades
- TFTP for firmware upgrades
- DHCP and BOOTP for IP address assignment
- HTTPS (SSL) for secure browser-based configuration
- NTP for time synchronization
- LDAP, NIS, RADIUS, CHAP, PAP, Kerberos, TACACS+, and SecurID (via RADIUS) for user authentication
- Callback Control Protocol (CBCP)

For descriptions of the protocols, see *Appendix F: Protocol Glossary*.

Access Control

The system administrator controls access to attached servers or devices by assigning access rights to up to 128 user profiles. Each user has an assigned ID, password, and access rights. Other user profile access options may include externally configured authentication methods such as NIS and LDAP.

Device Port Buffer

The SLC console manager supports real-time data logging for each device port. The port can save the data log to a file, send an email notification of an issue, or take no action.

You can define the path for logged data on a port-by-port basis, configure file size and number of files per port for each logging event, and configure the device log to send an email alert message automatically to the appropriate parties indicating a particular error.

Configuration Options

You may use the backlit front-panel LCD display for initial setup and later to view and configure current network, console, and date/time settings.

Both a web interface viewed through a standard browser and a command line interface (CLI) are available for configuring the SLC console manager settings and monitoring performance.

Hardware Features

The SLC hardware includes the following:

- 1U-tall (1.75 inches) rack-mountable secure console server
- Two 10Base-T/100Base-TX network ports
- Up to 48 RS-232 serial device ports connected via Category 5 (RJ45) wiring
- One serial console port for VT100 terminal or PC with emulation
- Two PC Card slots or one USB port
- 256 Kbytes-per-port buffer memory for device ports
- LCD display and keypad on the front
- Universal AC power input (100-240V, 50/60 Hz); options include single input, single supply or dual input, redundant supplies
- -48 VDC power input, dual input, redundant power supplies
- Convection cooled, silent operation, low power consumption

Note: *For more detailed information, see Technical Specifications on page 30.*

All physical connections use industry-standard cabling and connectors. The network and serial ports are on the rear panel of the SLC console manager, and the console port is on the front. Required cables and adapters for certain servers, switches, and other products are available from Lantronix at www.lantronix.com.

Serial Connections

All devices attached to the device ports and the console port must support the RS-232C (EIA-232) standard. Category 5 cabling with RJ45 connections is used for the device port connections and for the console port. For pinout information, see *Appendix E: Adapters and Pinouts*.

Note: *RJ45 to DB9/DB25 adapters are available from Lantronix.*

Device ports and the console port support eight baud-rate options: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 baud. The ports are shown in *Figure 2-4* and *Figure 2-5*.

Figure 2-4 Device Port Connections

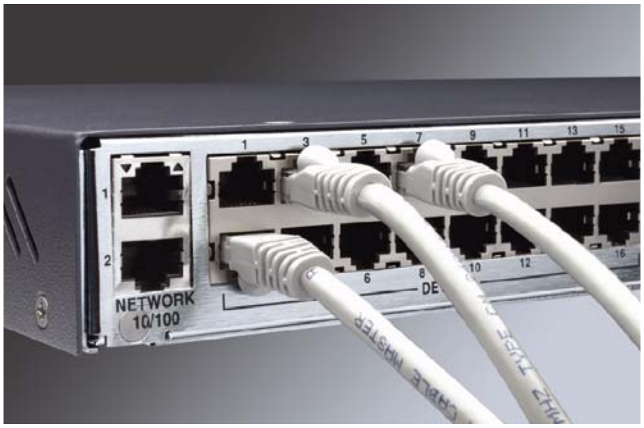
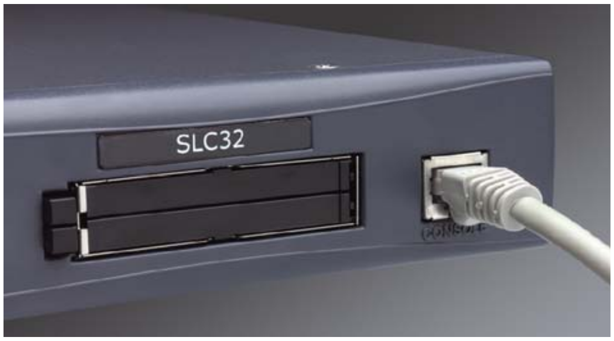


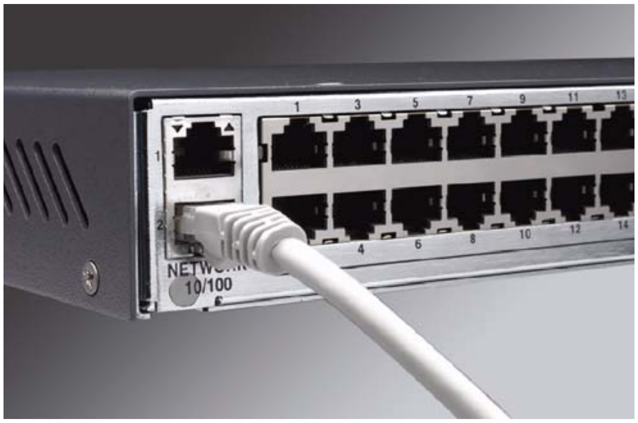
Figure 2-5 Console Port Connection



Network Connections

The SLC network interfaces are 10Base-T/100Base-TX connectors for use with a conventional Ethernet network as shown in *Figure 2-6*. Use standard RJ45-terminated Category 5 cables. Network parameters must be configured before the SLC console manager can be accessed over the network.

Figure 2-6 Network Connection

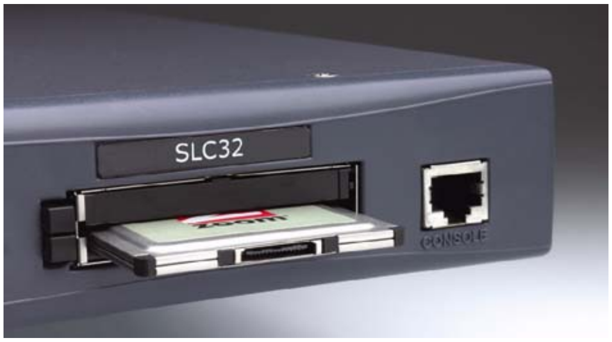


PC Card Interface

Note: *This PC Card interface is only supported on SLC -02 part numbers.*

The SLC console manager has two PC Card slots as shown in *Figure 2-7*. Lantronix qualifies cards continuously and publishes a list of qualified cards on the Lantronix web site.

Figure 2-7 PC Card Interface

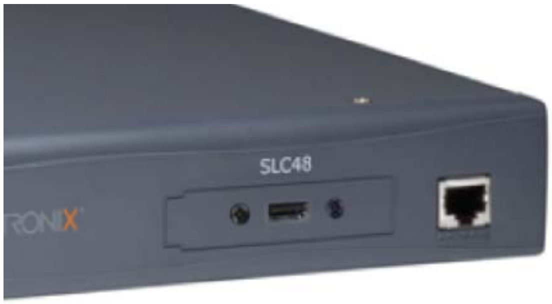


USB Port

Note: *This USB port is only supported on SLC -03 part numbers.*

The SLC console manager has a USB port as shown in *Figure 2-8*.

Figure 2-8 SLC Console Manager with USB Interface



3: Installation

This chapter provides a high-level procedure for installing the SLC console manager followed by more detailed information about the SLC connections and power supplies.

Caution: ***To avoid physical and electrical hazards, please be sure to read Appendix C: Safety Information on page 318 before installing the SLC device.***

It contains the following sections:

- *What's in the Box*
- *Technical Specifications*
- *Physical Installation*

What's in the Box

In addition to the SLC console manager, *Table 3-1* lists the components in the box and part numbers.

Table 3-1 Component Part Numbers and Descriptions

Component Part #	Description
Adapters	
200.2066A	Adapter: DB25M (DCE), Sun w/DB25 female
200.2067A	Adapter: DB25F (DCE) to RJ45, Sun w/DB25 male and some HP9000s
200.2069A	Adapter: DB9M (DCE) to RJ45, SGI Onyx
200.2070A	Adapter: DB9F (DCE) to RJ45, HP9000, SGI Origin, IBM RS6000, and PC-based Linux servers
ADP010104-01	Adapter: RJ45 rolled serial, Cisco, and Sun Netra
Note: *An optional adapter for an external modem is available from Lantronix. The part number is 200.2073 and description is DB25M (DCE) to RJ45.*	
Cables	
200.0063	Cable: RJ45 to RJ45, 6.6 ft (2 m)
500-153	Cable: Loopback
Power Cords	
500-041	For single AC models: one AC power cord For dual AC models: two AC power cords
083-011	For dual DC models: one accessory kit, containing DC plug connectors and instructions
Documentation	
	Quick Start Guide and SLC Console Manager User Guide available at http://www.lantronix.com/support/downloads/.

Verify and inspect the contents of the SLC package using the enclosed packing slip or the table above. If any item is missing or damaged, contact your place of purchase immediately.

Product Information Label

The product information label on the underside of the unit contains the following information about each specific unit:

- Part Number
- Serial Number Bar Code
- Serial Number and Date Code
- Regulatory Certifications and Statements

Technical Specifications

Table 3-2 lists the SLC technical specifications.

Table 3-2 Components and Descriptions

Component	Description
Serial Interface (Device)	RJ45-type 8-conductor connector (DTE) Speed software selectable (300 to 115,200 baud)
Serial Interface (Console)	RJ45-type 8-pin connector (DTE) Speed software selectable (300 to 115,200 baud)
Network Interface	10Base-T/100Base-TX RJ45 Ethernet
Power Supply	Universal AC power input: 100-240 VAC, 50 or 60 Hz IEC-type regional cord set included DC power input: -24 to -60 VDC
Power Consumption	Less than 20 watts
Dimensions	1U, 1.75 in x 17.25 in x 12 in
Weight	10 lbs or less, depending on the options
Temperature	Operating: 0 to 50 °C (32 to 122 °F), 30 to 90% RH, non-condensing Storage: -20 to 70 °C (-4 to 158 °F), 10 to 90% RH, non-condensing
Relative Humidity	Operating: 10% to 90% non-condensing; 40% to 60% recommended Storage: 10% to 90% non-condensing
Heat Flow Rate	68 BTU per hour

Install the SLC console manager in an EIA-standard 19-inch rack (1U tall) or as a desktop unit. The SLC device uses convection cooling to dissipate excess heat.

Physical Installation

To install the unit in a rack:

1. Place the unit in a 19-inch rack.

Warning: ***Be careful not to block the air vents on the sides of the unit. If you mount the SLC console manager in an enclosed rack, we recommended that the rack have a ventilation fan to provide adequate airflow through the unit.***

2. Connect serial devices to the SLC device ports. See *Connecting to Device Ports on page 31.*
3. Install any PC Cards or USB devices that you intend to use. If you install a modem card, connect to the phone line. See *Chapter 9: PC Cards* or *10: USB Port.* You have the following options:
    a. To configure the SLC console manager using the network, or to monitor serial devices on the network, connect at least one SLC network port to a network. See *Connecting to Network Ports on page 32.*

    b. To configure the SLC console manager using a dumb terminal or a computer with terminal emulation, connect the terminal or PC to the SLC console port. See *Connecting to Terminals on page 32*.
4. Connect the power cord, and apply power. See *Power on page 32.*
5. Wait approximately a minute and a half for the boot process to complete. When the boot process ends, the SLC host name and the clock appear on the LCD display.

   Now you are ready to configure the network settings as described in *Chapter 4: Quick Setup .*

Connecting to Device Ports

You can connect any device that has a serial console port to a device port on the SLC console manager for remote administration. The console port must support the RS-232C interface.

Note: *Many servers must have the serial port enabled as a console or the keyboard and mouse detached. Consult the server hardware and/or software documentation for more information.*

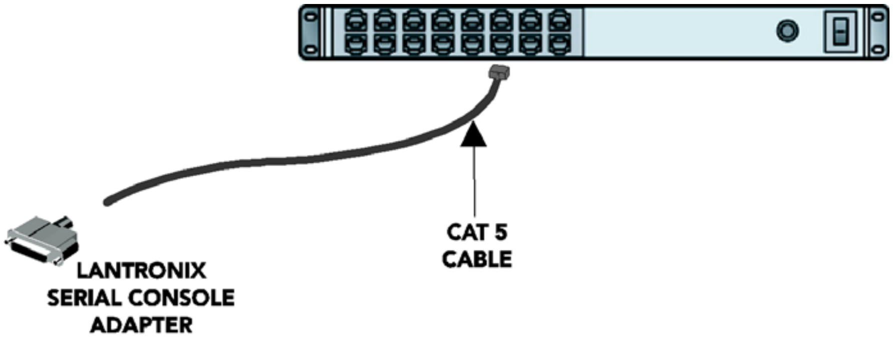
To connect to a device port:

1. Connect one end of the Cat 5 cable to the device port.
2. Connect the other end of the Cat 5 cable to a Lantronix serial console adapter.

Note: *To connect a device port to a Lantronix SLP™ power manager, use the rolled serial cable provided with the unit, a 200.2225 adapter and Cat 5 cabling, or the ADP010104 adapter that eliminates the need for an additional Cat 5 patch cable between the adapter and the connected equipment. See Appendix E: Adapters and Pinouts on page 324 for more information about Lantronix adapters.*

3. Connect the adapter to the serial console of the serial device as shown in *Figure 3-3*.

Figure 3-3 CAT 5 Cable Connection



Connecting to Network Ports

The SLC network ports, 10Base-T/100Base-TX, allow remote access to the attached devices and the system administrative functions. Use a standard RJ45-terminated Category 5 cable to connect to the network port.

Note: *One possible use for the two Ethernet ports is to have one port on a private, secure network, and the other on an unsecured network.*

Connecting to Terminals

The console port is for local access to the SLC console manager and the attached devices. You may attach a dumb terminal or a computer with terminal emulation to the console port. The SLC console port uses RS-232C protocol and supports VT100 emulation. The default baud rate is 9600.

To connect the console port to a terminal or computer with terminal emulation, Lantronix offers optional adapters that provide a connection between an RJ45 jack and a DB9 or DB25 connector. The console port is configured as DTE. For more information, see *Appendix E: Adapters and Pinouts on page 324* and go to the Lantronix web site at www.lantronix.com/support and click Cable/Adapter Lookup on the **Support** menu.

To connect a terminal:

1. Attach the Lantronix adapter to your terminal (use **PN 200.2066A** adapter) or your PC's serial port (use **PN 200.2070A** adapter).
2. Connect the Cat 5 cable to the adapter, and connect the other end to the SLC console port.
3. Turn on the terminal or start your computer's communication program (e.g., HyperTerminal for Windows).
4. Once the SLC console manager is running, press **Enter** to establish connection. You should see the model name and a **login** prompt on your terminal. You are connected.

Power

The SLC device consumes less than 20W of electrical power.

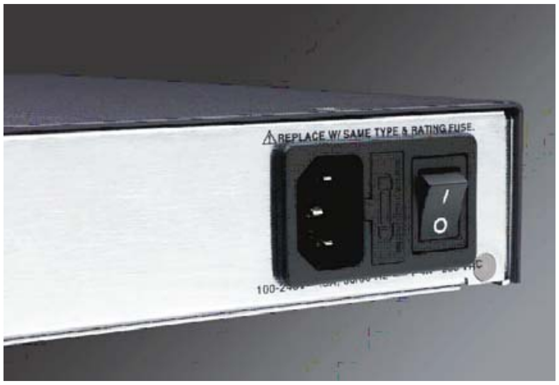
AC Input

The SLC console manager has a universal auto-switching AC power supply. The power supply accepts AC input voltage between 100 and 240 VAC with a frequency of 50 or 60 Hz. Rear-mounted IEC-type AC power connector(s) are provided for universal AC power input (North American cord provided).

The SLC0xx12N models have a single supply/input, while the SLC0xx22N models have dual inputs and dual supplies. The power connector also houses a replaceable protective fuse (fast-blow 4.0A, maximum 250V AC) and the on/off switch. In addition, we provide the SLC0xx22N with a "Y" cord. See the SLC models listed in Table 3-2 on page 30.

Figure 3-4 shows the AC power inputs and power switch.

Figure 3-4 AC Power Input and Power Switch (SLCxxxx2N)

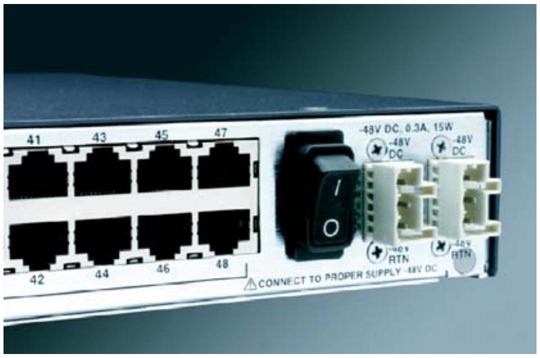


Note: *The SLC48 console manager with dual AC does not have an on/off switch.*

DC Input

The DC version of the SLC console manager accepts standard –48 VDC power. The SLC0xx24T models accept two DC power inputs for supply redundancy. Lantronix provides the DC power connections using industry standard Wago connectors. One set of connectors is included with the SLC console manager. You can order additional connectors (part number 721-103/031-000) from the Wago catalog at http://www.wagocatalog.com/okv3/index.asp?lid=1&cid=1&str_from_home=first. *Figure 3-5* shows the DC power inputs and power switch.

Figure 3-5 DC Power Inputs and Power Switch (SLCxxx24T)



4: Quick Setup

This chapter helps get the IP network port up and running quickly, so you can administer the SLC console manager using your network.

Recommendations

To set up the network connections quickly, we suggest you do one of the following:

- Use the front panel LCD display and keypads.
- Complete the *Quick Setup* on the web interface.
- SSH to the command line interface and follow the Quick Setup script on the command line interface.
- Connect to the console port and follow the Quick Setup script on the command line interface.

Note: *The first time you power up the SLC unit, Eth1 tries to obtain its IP address via DHCP. If you have connected Eth1 to the network, and Eth1 is able to acquire an IP address, you can view this IP address on the LCD or by running the . If Eth1 cannot acquire an IP address, you cannot use Telnet, SSH, or the web interface to run Quick Setup.*

IP Address

Your SLC console manager must have a unique IP address on your network. The system administrator generally provides the IP address and corresponding subnet mask and gateway. The IP address must be within a valid range, unique to your network, and in the same subnet as your PC.

The following table lists the options for assigning an IP address to your SLC unit.

Table 4-1 Methods of Assigning an IP Address

Method	Description
DHCP	A DHCP server automatically assigns the IP address and network settings. The SLC console manager is DHCP-enabled by default. With the Eth1 network port connected to the network, and the SLC unit powered up, Eth1 acquires an IP address, viewable on the LCD. At this point, you can use SSH or Telnet to connect to the SLC console manager, or use the web interface.
BOOTP	Similar to DHCP but for smaller networks.
DeviceInstaller™	The Lantronix DeviceInstaller is a Windows-based GUI application that provides an easy way to install and configure specific Lantronix device server products. You may utilize DeviceInstaller to assign an IP and other network specific addresses.
Front panel LCD display and keypads	You manually assign the IP address and other basic network, console, and date/time settings. If desired, you can restore the factory defaults.

Method (continued)	Description
Serial port login to command line interface	You assign an IP address and configure the SLC device using a terminal or a PC running a terminal emulation program to the SLC console manager's serial console port connection.

Method #1 Using the Front Panel Display

Before you begin, ensure that you have:

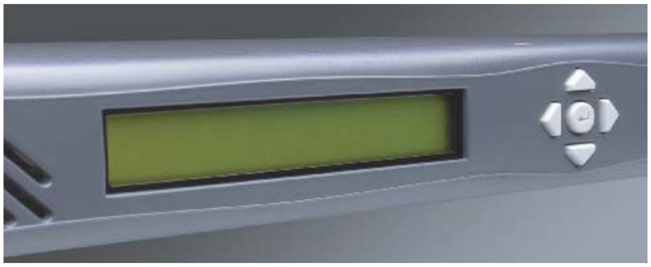
- Unique IP address that is valid on your network (unless automatically assigned)
- Subnet mask (unless automatically assigned)
- Gateway
- DNS settings
- Date, time, and time zone
- Console port settings: baud rate, data bits, stop bits, parity, and flow control

Make sure the SLC console manager is plugged into power and turned on.

Front Panel LCD Display and Keypads

With the SLC device powered up, you can use the front panel display and keypads to set up the basic parameters.

Figure 4-2 Front Panel LCD Display and Five Button Keypads (Enter, Up, Down, Left, Right)



The front panel display initially shows the hostname (abbreviated to 14 letters) and total current level.

When you click the right-arrow keypad, the SLC console manager's network settings display. Using the five keypads, you can change the network, console port, and date/time settings and view the firmware release version. If desired, you can restore the factory defaults.

Note: Have your information handy as the display times out without accepting any unsaved changes if you take more than 30 seconds between entries.

Any changes made to the network, console port, and date/time settings take effect immediately.

Navigating

The front panel keypad has one **Enter** button (in the center) and four arrow buttons (up, left, right, and down). Press the arrow buttons to navigate from one option to another, or to increment or decrement a numerical entry of the selected option. Use the **Enter** button to select an option to change or to save your settings.

The following table lists the SLC navigation actions, buttons, and options.

Table 4-3 LCD Arrow Keypad Actions

Button	Action
Right arrow	To move to the next option (e.g., from Network Settings to Console Settings)
Left arrow	To return to the previous option
Enter (center button)	To enter edit mode
Up and down arrows	Within edit mode, to increase or decrease a numerical entry
Right or left arrows	Within edit mode, to move the cursor right or left
Enter	To exit edit mode
Up and down arrows	To scroll up or down the list of parameters within an option (e.g., from IP Address to Mask)

Table 4-4 Front Panel Setup Options with Associated Parameters

⬅ Left/Right Arrow ➡

⬆ Up/ Down Arrow ⬇

Network Settings	Console Settings	Date / Time Settings	Release	Internal Temp	User Strings	Location	Device Ports	Current Time
Eth1 IP Address	Baud Rate	Time Zone	Firmware version and date code (display only)	Reading in Celsius & Fahrenheit	Displays configured user string(s), if any.	Indicates the Rack (RK), Row (RW) & Cluster (CW) locations.	Detects the connection state of each port: 0=No serial connection 1=Serial connection detected.	User ID & Current TIme
Eth1 Subnet Mask	Data Bits	Date/Time	Restore Factory Defaults					
Gateway	Stop Bits							
DNS1	Parity							
DNS2	Flow Control							
DNS3								

Note: *The individual screens listed from left to right in Table 4-4 can be enabled or disabled for display on the SLC LCD screen. The order of appearance of the screens, if enabled, along with the elected "Home Page" may vary on the LCD monitor according to configuration. See LCD/Keypad (on page 241) for instructions on enabling and disabling screens.*

Entering the Settings

To enter setup information:

1. From the normal display (host name, date and time), press the right arrow button to display Network Settings. The IP address for Eth1 displays.

Note: *If you have connected Eth1 to the network, and Eth1 is able to acquire an IP address through DHCP, this IP address displays, followed by the letter [D]. Otherwise, the IP address displays as all zeros (000.000.000.000).*

2. Press the **Enter** button on the keypad to enter edit mode. A cursor displays below one character of the existing IP address setting.
3. To enter values:
   - Use the left or right arrow to move the cursor to the left or to the right position.
   - Use the up or down arrow to increment or decrement the numerical value.
4. When you have the IP address as you want it, press **Enter** to exit edit mode, and then press the down arrow button. The Subnet Mask parameter displays.

Note: *You must edit the IP address and the Subnet Mask together for a valid IP address combination.*

5. To save your entries for one or more parameters in the group, press the right arrow button. The Save Settings? Yes/No prompt displays.

Note: *If the prompt does not display, make sure you are no longer in edit mode.*

6. Use the left/right arrow buttons to select **Yes**, and press the **Enter** button.
7. Press the right arrow button to move to the next option, **Console Settings**.
8. Repeat steps 2-7 for each setting.
9. Press the right arrow button to move to the next option, **Date/Time Settings**, and click **Enter** to edit the time zone.
   - To enter a US time zone, use the up/down arrow buttons to scroll through the US time zones, and then press **Enter** to select the correct one.
   - To enter a time zone outside the US, press the left arrow button to move up to the top level of time zones. Press the up/down arrow button to scroll through the top level.

     A time zone with a trailing slash (such as Africa/) has sub-time zones. Use the right arrow button to select the Africa time zones, and then the up/down arrows to scroll through them.

     Press **Enter** to select the correct time zone. To move back to the top-level time zone at any time, press the left arrow.
10. To save your entries, press the right arrow button. The **Save Settings? Yes/No** prompt displays.

Note: *If the prompt does not display, make sure you are no longer in edit mode.*

11. Use the left/right arrow buttons to select **Yes**, and press the **Enter** button.
12. To review the saved settings, press the up or down arrows to step through the current settings.

When you are done, the front panel returns to the clock display. The network port resets to the new settings, and you can connect to your IP network for further administration. You should be able to SSH to the SLC console manager through your network connection, or access the Web interface through a Web browser.

Restoring Factory Defaults

To use the LCD display to restore factory default settings:

1. Press the right arrow button to move to the last option, **Release**.
2. Use the down arrow to move to the **Restore Factory Defaults** option. A prompt for the 6-digit Restore Factory Defaults password displays.
3. Press **Enter** to enter edit mode.
4. Using the left and right arrows to move between digits and the up and down arrows to change digits, enter the password (the default password is 999999).

Note: *The Restore Factory Defaults password is only for the LCD. You can change it at the command line interface using the* `admin keypad password` *command.*

5. Press **Enter** to exit edit mode. If the password is valid, a Save Settings? Yes/No prompt displays.
6. To initiate the process for restoring factory defaults, select **Yes**. When the process is complete, the SLC unit reboots.

Method #2 Quick Setup on the Web Page

After the unit has an IP address, you can use the *Quick Setup* page to configure the remaining network settings. This page displays the first time you log into the SLC console manager only. Otherwise, the SLC Home Page displays.

To complete the Quick Setup page:

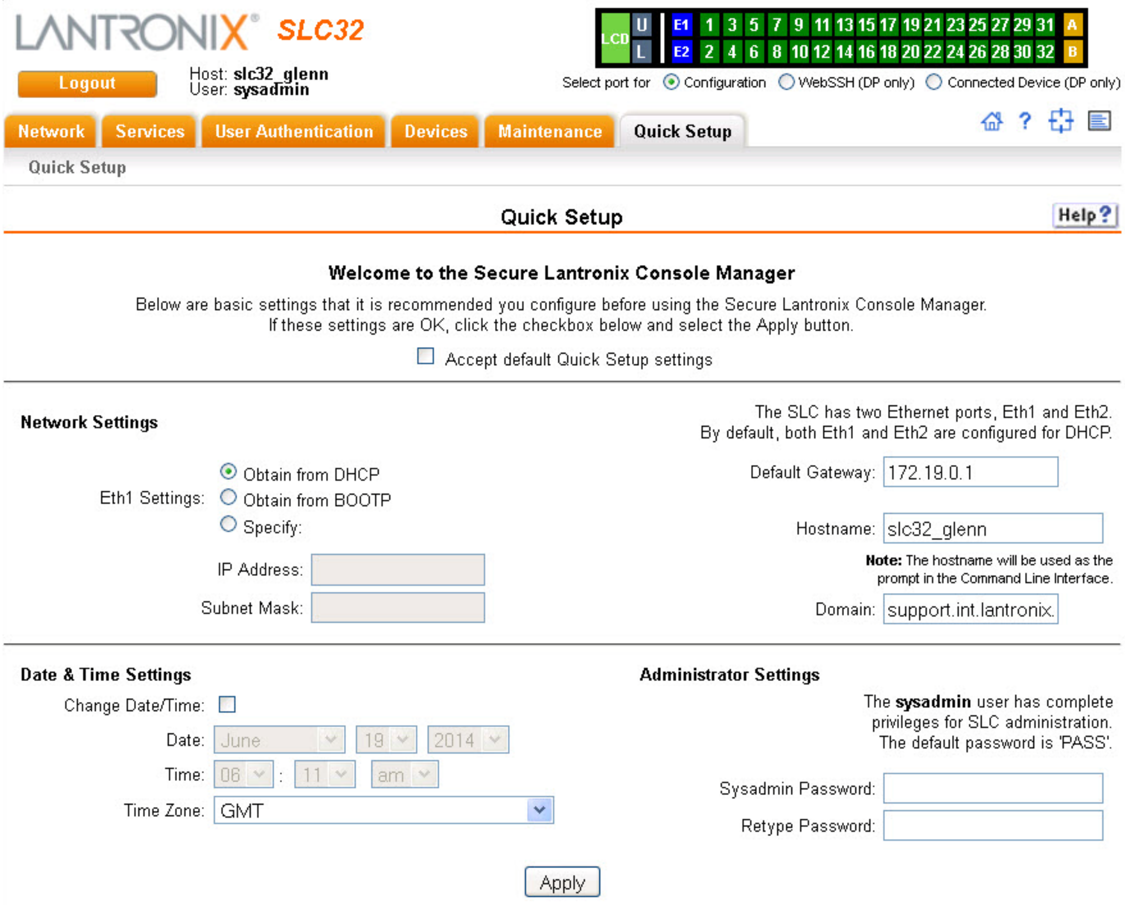
1. Open a web browser (Firefox, Chrome or Internet Explorer with JavaScript enabled).
2. In the URL field, type `https://` followed by the IP address of your SLC console manager.

Note: *The web server listens for requests on the unencrypted (HTTP) port (port 80) and redirects all requests to the encrypted (HTTPS) port (port 443).*

3. Log in using `sysadmin` as the user name and `PASS` as the password. The first time you log in to the SLC unit, the *Quick Setup* page automatically displays. Otherwise, the Home page displays.

Note: *To open the Quick Setup page at another time, click the Quick Setup tab.*

Figure 4-5 Quick Setup



Host: slc32_glenn
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Quick Setup

Quick Setup

Welcome to the Secure Lantronix Console Manager

Below are basic settings that it is recommended you configure before using the Secure Lantronix Console Manager.
If these settings are OK, click the checkbox below and select the Apply button.

□ Accept default Quick Setup settings

Network Settings

The SLC has two Ethernet ports, Eth1 and Eth2.
By default, both Eth1 and Eth2 are configured for DHCP.

Eth1 Settings: ● Obtain from DHCP ○ Obtain from BOOTP ○ Specify:

IP Address:

Subnet Mask:

Default Gateway: 172.19.0.1

Hostname: slc32_glenn

Note: The hostname will be used as the prompt in the Command Line Interface.

Domain: support.int.lantronix.

Date & Time Settings

Change Date/Time: □

Date: June 19 2014

Time: 06 : 11 am

Time Zone: GMT

Administrator Settings

The **sysadmin** user has complete privileges for SLC administration. The default password is 'PASS'.

Sysadmin Password:

Retype Password:

4. To accept the defaults, select the **Accept** default Quick Setup settings checkbox in the top portion of the page and click the **Apply** button at the bottom of the page. Otherwise, continue with step 5.

*Note: Once you click the **Apply** button on the Quick Setup page, you can continue using the web interface to configure the SLC console manager further.*

5. Enter the following settings:

Network Settings

Note: Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.

Network Setting	Description
Eth 1 Settings	◆ **Obtain from DHCP:** Acquires IP address, subnet mask, hostname and gateway from the DHCP server. (The DHCP server may not provide the hostname gateway, depending on its setup.) This is the default setting. If you select this option, skip to **Gateway**. ◆ **Obtain from BOOTP:** Lets a network node request configuration information from a BOOTP "server" node. If you select this option, skip to **Gateway**. ◆ **Specify:** Lets you manually assign a static IP address, generally provided by the system administrator.

Network Setting	Description
IP Address (if specifying)	◆ Enter an IP address that is unique and valid on your network. There is no default. ◆ Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is `172.19.201.28`, do not enter `028` for the last segment. *Note: Currently, the SLC unit does not support configurations with the same IP subnet on multiple interfaces (Ethernet or PPP).*
Subnet Mask	If specifying an IP address, enter the subnet mask for the network on which the SLC console manager resides. There is no default.
Default Gateway	The IP address of the router for this network. There is no default.
Hostname	The default host name is `slcXXXX`, where `XXXX` is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). The host name becomes the prompt in the command line interface.
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC unit. For example, if abcd is specified for the SMTP server, and mydomain.com is specified for the domain, if abcd cannot be resolved, the SLC device attempts to resolve **abcd.mydomain.com** for the SMTP server.

Date & Time Settings

Date & Time Setting	Description
Change Date/Time	Select the checkbox to manually enter the date and time at the SLC unit's location.
Date	From the drop-down lists, select the current month, day, and year.
Time	From the drop-down lists, select the current hour and minute.
Time Zone	From the drop-down list, select the appropriate time zone.

Administrator Settings

Administrator Setting	Description
Sysadmin Password	To change the password (e.g., from the default) enter a Sysadmin Password of up to 64 characters.
Retype Password	Re-enter the Sysadmin Password above in this field as a confirmation.

6. Click the **Apply** button to save your entries.

Method #3 Quick Setup on the Command Line Interface

If the SLC console manager does not have an IP address, you can connect a dumb terminal or a PC running a terminal emulation program (VT100) to access the command line interface. (See *Connecting to Terminals on page 32*.) If the unit has an IP address, you can use SSH or Telnet to connect to the SLC unit.

Note: By default, Telnet is disabled and SSH is enabled. To enable Telnet, use the Services > SSH/Telnet/Logging page (see Chapter 7: Services on page 68), a serial terminal connection, or an SSH connection.

To complete the command line interface Quick Setup script:

1. Do one of the following:
   - With a serial terminal connection, power up, and when the command line displays, press **Enter**.
   - With a network connection, use an SSH program or Telnet program (if Telnet has been enabled) to connect to `xx.xx.xx.xx` (the IP address in dot quad notation), and press **Enter**. You should be at the login prompt.
2. Enter `sysadmin` as the user name and press **Enter**.
3. Enter `PASS` as the password and press **Enter**. The first time you log in, the Quick Setup script runs automatically. Normally, the command prompt displays.

Figure 4-6 Beginning of Quick Setup Script

```
Quick Setup will now step you through configuring a few basic settings.

The current settings are shown in brackets ('[]').
You can accept the current setting for each question by pressing
<return>.
```

4. Enter the following information at the prompts:

Note: *To accept a default or to skip an entry that is not required, press* ***Enter****.*

CLI Quick Setup Settings	Description
Configure Eth1	Select one of the following: ◆ **<1> obtain IP Address from DHCP:** The unit will acquire the IP address, subnet mask, hostname, and gateway from the DHCP server. (The DHCP server may or may not provide the gateway and hostname, depending on its setup.) This is the default setting. ◆ **<2> obtain IP Address from BOOTP:** Permits a network node to request configuration information from a BOOTP "server" node. ◆ **<3> static IP Address:** Allows you to assign a static IP address manually. The IP address is generally provided by the system administrator.
IP Address (if specifying)	An IP address that is unique and valid on your network and in the same subnet as your PC. There is no default. If you selected **DHCP** or **BOOTP**, this prompt does not display. Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is 172.19.201.28, do not enter 028 for the last segment. ***Note:*** *Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.*
Subnet Mask	The subnet mask specifies the network segment on which the SLC console manager resides. There is no default. If you selected DHCP or BOOTP, this prompt does not display.
Default Gateway	IP address of the router for this network. There is no default.

CLI Quick Setup Settings	Description
Hostname	The default host name is `slcXXXX`, where `XXXX` is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). ***Note:*** *The host name becomes the prompt in the command line interface.*
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC unit. For example, if **abcd** is specified for the SMTP server, and **mydomain.com** is specified for the domain, if **abcd** cannot be resolved, the SLC device attempts to resolve **abcd.mydomain.com** for the SMTP server.
Time Zone	If the time zone displayed is incorrect, enter the correct time zone and press **Enter**. If the entry is not a valid time zone, the system guides you through selecting a time zone. A list of valid regions and countries displays. At the prompts, enter the correct region and country.
Date/Time	If the date and time displayed are correct, type **n** and continue. If the date and time are incorrect, type **y** and enter the correct date and time in the formats shown at the prompts.
Sysadmin password	Enter a new sysadmin password.

After you complete the Quick Setup script, the changes take effect immediately.

Figure 4-7 Completed Quick Setup

```
Quick Setup will now step you through configuring a few basic settings.

The current settings are shown in brackets ('[]').
You can accept the current setting for each question by pressing
<return>.

____Ethernet Port and Default Gateway_______________________________
The SLC32 has two ethernet ports, Eth1 and Eth2.
By default, both ports are configured for DHCP.
Configure Eth1:  (1) obtain IP Address from DHCP
                 (2) obtain IP Address from BOOTP
                 (3) static IP Address
Enter 1-3: [1]

The SLC32 can be configured to use a default gateway.
Enter gateway IP Address: [none]

____Hostname________________________________________________________
The current hostname is 'slc', and the current domain is '<undefined>'.
The hostname will be shown in the CLI prompt.
Specify a hostname: [slc]
Specify a domain: [<undefined>]

____Time Zone_______________________________________________________
The current time zone is 'GMT'.
Enter time zone: [GMT]

____Date/Time_______________________________________________________
```

```
The current time is Mon Jun  5 02:33:17 2000
Change the current time? [n]

____Sysadmin Password___________________________________________________
Enter new password: [<current password>]

Quick Setup is now complete.
```

Next Step

After completing quick setup on the SLC console manager, you may want to configure other settings. You can use the web page or the command line interface for configuration.

- For information about the web and the command line interfaces, go to *Chapter 5: Web and Command Line Interfaces*.
- To continue configuring the SLC unit, go to *Chapter 6: Basic Parameters*.

5: Web and Command Line Interfaces

The SLC console manager offers three interfaces for configuring the SLC unit: a command line interface (CLI), a web interface, and an LCD with keypads on the front panel. This chapter discusses the web and command line interfaces. (*Chapter 4: Quick Setup* includes instructions for using the LCD to configure basic network settings.)

Note: *The features and functionality described in this chapter specific to PC Card use are supported on SLC -02 part numbers. The features and functionality specific to USB port use are supported on SLC -03 part numbers.*

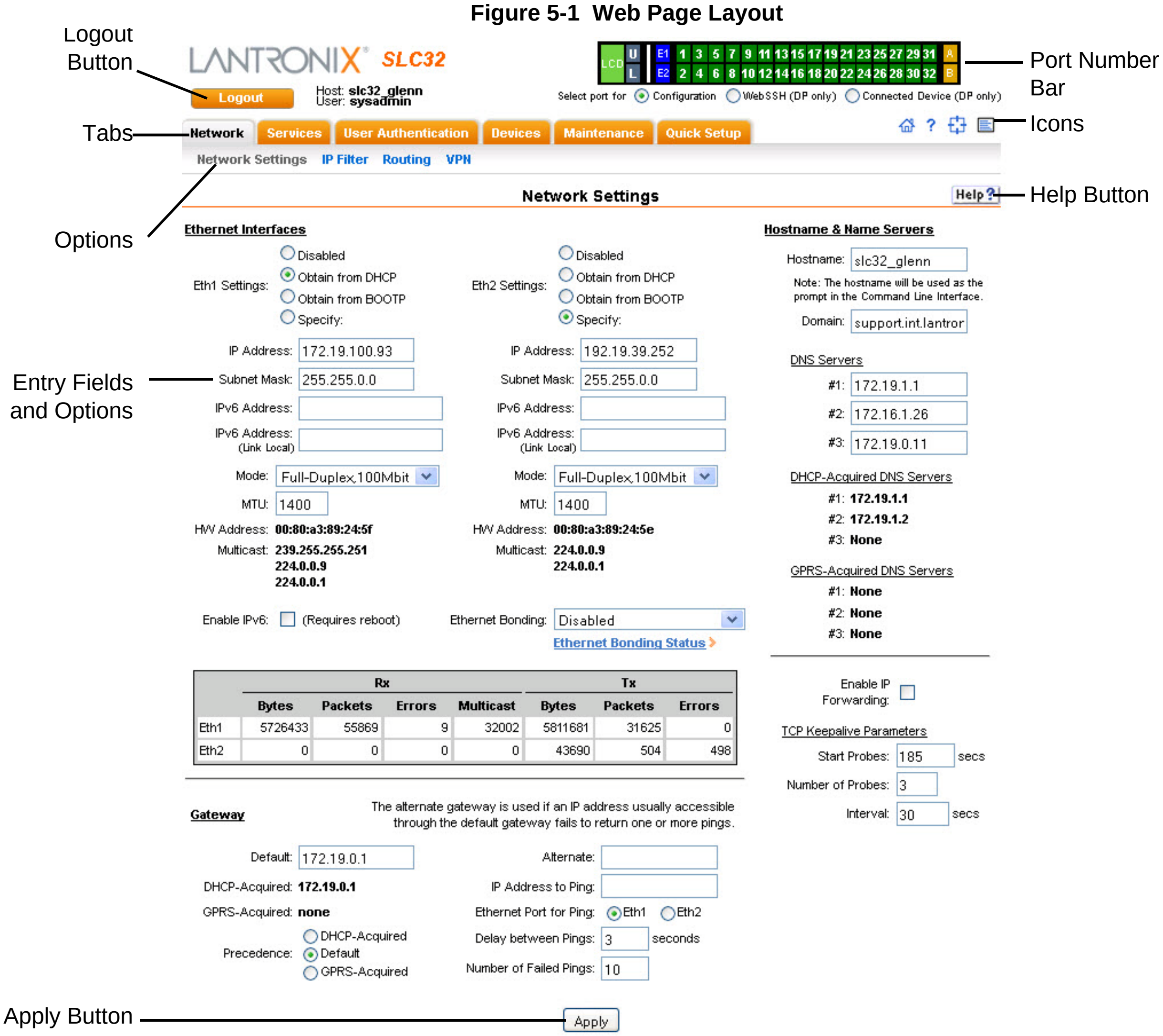
Web Interface

A web interface allows the system administrator and other authorized users to configure and manage the SLC console manager using most web browsers (Firefox, Chrome or Internet Explorer with JavaScript enabled). The Web Telnet and Web SSH features require Java 1.1 (or later) support in the browser. The SLC device provides a secure, encrypted web interface over SSL (secure sockets layer).

Note: *The web server listens for requests on the unencrypted (HTTP) port (port 80) and redirects all requests to the encrypted (HTTPS) port (port 443).*

The following figure shows a typical web page:

Figure 5-1 Web Page Layout



Host: **slc32_glenn**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Network Settings

Ethernet Interfaces

Eth1 Settings: ○ Disabled ● Obtain from DHCP ○ Obtain from BOOTP ○ Specify:

IP Address: 172.19.100.93
Subnet Mask: 255.255.0.0
IPv6 Address:
IPv6 Address: (Link Local)
Mode: Full-Duplex,100Mbit
MTU: 1400
HW Address: **00:80:a3:89:24:5f**
Multicast: **239.255.255.251**
224.0.0.9
224.0.0.1

Enable IPv6: □ (Requires reboot)

Eth2 Settings: ○ Disabled ○ Obtain from DHCP ○ Obtain from BOOTP ● Specify:

IP Address: 192.19.39.252
Subnet Mask: 255.255.0.0
IPv6 Address:
IPv6 Address: (Link Local)
Mode: Full-Duplex,100Mbit
MTU: 1400
HW Address: **00:80:a3:89:24:5e**
Multicast: **224.0.0.9**
224.0.0.1

Ethernet Bonding: Disabled

Hostname & Name Servers

Hostname: slc32_glenn
Note: The hostname will be used as the prompt in the Command Line Interface.
Domain: support.int.lantror

DNS Servers
#1: 172.19.1.1
#2: 172.16.1.26
#3: 172.19.0.11

DHCP-Acquired DNS Servers
#1: **172.19.1.1**
#2: **172.19.1.2**
#3: **None**

GPRS-Acquired DNS Servers
#1: **None**
#2: **None**
#3: **None**

Enable IP Forwarding: □

TCP Keepalive Parameters
Start Probes: 185 secs
Number of Probes: 3
Interval: 30 secs

	Rx				Tx		
	Bytes	**Packets**	**Errors**	**Multicast**	**Bytes**	**Packets**	**Errors**
Eth1	5726433	55869	9	32002	5811681	31625	0
Eth2	0	0	0	0	43690	504	498

Gateway

The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

Default: 172.19.0.1
DHCP-Acquired: **172.19.0.1**
GPRS-Acquired: **none**
Precedence: ○ DHCP-Acquired ● Default ○ GPRS-Acquired

Alternate:
IP Address to Ping:
Ethernet Port for Ping: ● Eth1 ○ Eth2
Delay between Pings: 3 seconds
Number of Failed Pings: 10

The web page has the following components:

- **Tabs:** Groups of settings to configure.
- **Options:** Below each tab are options for specific types of settings. Only those options for which the currently logged-in user has rights display.
- **Port and Power Outlet Bar:**
  - The light green **LCD** button allows you to configure the front panel LCD
  - The gray **U1** button allows you to configure the USB device (flash drive or modem) plugged into the front panel USB connector. The gray **U2** button allows you to configure the internal USB dial-up modem.
  - The blue **E1** and **E2** buttons display the *Network > Network Settings* page.
  - The **A** and **B** buttons display the status of the power supplies. Only ports to which the currently logged-in user has rights are enabled.
  - The green number buttons allow you to select a port and display its settings. Only ports to which the currently logged-in user has rights are enabled.

Below the bar are options for use with the port buttons. Selecting a port and the **Configuration** option takes you to the *Device Ports > Settings* page. Selecting a port and the **WebSSH** option displays the WebSSH window for the device port --if Web SSH is enabled, and if SSH is enabled for the device port. Selecting the port and the **Connected Device** button allows access to supported devices such as SLPs and/or SensorSoft temperature and humidity probes connected to the device port.

- **Entry Fields and Options:** Allow you to enter data and select options for the settings.

Note: *For specific instructions on completing the fields on the web pages, see Chapters 5 through 12.*

- **Apply Button**: Apply on each web page makes the changes immediately and saves them so they will be there when the SLC console manager is rebooted.
- **Icons**: The icon bar above the Main Menu has icons that display the following:

  ⌂ Home page.

  ? Information about the SLC unit and Lantronix contact information.

  ⌖ Configuration site map.

  ☰ Status of the SLC device.

- **Help Button**: Provides online Help for the specific web page.

Logging In

Only the system administrator or users with web access rights can log into the web page. More than one user at a time can log in, but the same user cannot login more than once. See *Chapter 15: Command Reference* for more information.

To log in to the SLC console manager web interface:

1. Open a web browser.
2. In the URL field, type `https://` followed by the IP address of your SLC unit.
3. To configure the SLC console manager, use `sysadmin` as the user name and `PASS` as the password. (These are the default values.)

Note: *The system administrator may have changed the password using one of the Quick Setup methods in the previous chapter. When SecurID over RADIUS is used, the user must enter the passcode corresponding to their RSA token. Depending on the state of the user, the login pages may also require a new PIN number, the next passcode, or the next tokencode.*

The Lantronix SLC *Quick Setup* page displays automatically the first time you log in. Subsequently, the Lantronix SLC Home page displays. (If you want to display the *Quick Setup* page again, click **Quick Setup** on the main menu.)

Logging Out

To log off the SLC web interface:

1. Click the **Logout** button located on the upper left part of any user interface page. You are brought back to the login screen when logout is complete.

Web Page Help

To view detailed information about an SLC web page:

1. Click the **Help** button to the right of any user interface page. Online Help contents will appear in a new browser.

Command Line Interface

A command line interface (CLI) is available for entering all the commands you can use with the SLC console manager. You can access the command line interface using Telnet, SSH, or a serial terminal connection. Each command that corresponds to the web interface description in each chapter gets listed as a cross-reference to the complete command syntax and description contained in *Chapter 15: Command Reference*.

Note: *By default, Telnet is disabled and SSH is enabled. To enable Telnet, use the Services > SSH/Telnet/Logging web page, a serial terminal connection, or an SSH connection. (See Chapter 7: Services.)*

The sysadmin user and users with who have full administrative rights have access to the complete command set, while all other users have access to a reduced command set based on their permissions.

Logging In

To log in to the SLC command line interface:

1. Do one of the following:
   - With a serial terminal connection, power up, and when the command line displays, press **Enter**.
   - If the SLC console manager already has an IP address (assigned previously or assigned by DHCP), Telnet (if Telnet has been enabled) or SSH to `xx.xx.xx.xx` (the IP address in dot quad notation) and press **Enter**. The login prompt displays.
2. To login as the system administrator for setup and configuration:
   1. Enter **sysadmin** as the user name and press **Enter**.
   2. Enter **PASS** as the password and press **Enter**. The first time you log in, the Quick Setup script runs automatically. Normally, the command prompt displays. (If you want to display the Quick Setup script again, use the `admin quicksetup` command.)

      Note: *The system administrator may have changed the password using one of the Quick Setup methods in the previous chapter.*
3. To login any other user:

a. Enter your SLC user name and press **Enter**.

b. Enter your SLC password and press **Enter**.

Note: *The system administrator may have changed the password using one of the Quick Setup methods in the previous chapter.*

To log in any other user:

1. Enter your SLC user name and press **Enter**.
2. Enter your SLC password and press **Enter**.

Logging Out

To log out of the SLC command line interface, type `logout` and press **Enter**.

Command Syntax

Commands have the following format:

```
<action> <category> <parameter(s)>
```

where

`<action>` is `set`, `show`, `connect`, `admin`, `diag`, `pccard`, or `logout`.

`<category>` is a group of related parameters whose settings you want to configure or view. Examples are `ntp`, `deviceport`, and `network`.

`<parameter(s)>` is one or more name-value pairs in one of the following formats:

`<parameter name> <aa|bb>`	User must specify one of the values (aa or bb) separated by a vertical line (|). The values are in all lowercase and must be entered exactly as shown. Bold indicates a default value.
`<parameter name> <Value>`	User must specify an appropriate value, for example, an IP address. The parameter values are in mixed case. Square brackets [ ] indicate optional parameters.

Table 5-2 Actions and Category Options

Action	Category
`set`	`auth	cifs	cli	command	consoleport	datetime	deviceport	group	history	hostlist	ipfilter	kerberos	ldap	localusers	log	menu	network	nfs	nis	ntp	password	radius	remoteusers	routing	script	services	slcnetwork	sshkey	tacacs+	temperature	usb`[1] `| vpn`

Action	Category
`show`	`auth | auditlog | cifs | cli | connections | consoleport | datetime | deviceport | emaillog | group | history | hostlist | ipfilter | kerberos | ldap | localusers | log | menu | network | nfs | nis | ntp | pccard`[2] `| portcounters | portstatus | radius | remoteusers | routing | script | services | slcnetwork | sshkey | sysconfig | syslog | sysstatus | tacacs+ | temperature | user | usb`[1] `| vpn`
`connect`	`bidirection | direct | global | listen | script | terminate | unidirection`
`diag`	`arp | internals | lookup | loopback | netstat | nettrace | perfstat | ping | ping6| sendpacket | traceroute`
`pccard`[2]	`modem|storage`
`admin`	`banner | clear | config | events | firmware | ftp | keypad | lcd | memory | quicksetup | reboot| shutdown | site | version | web`
`logout`	`terminates CLI session`

[1] USB commands are only accessible on SLC USB part numbers -03.

[2] PC Card commands are only accessible on SLC USB part number -02.

Command Line Help

- For general Help and to display the commands to which you have rights, type: `help`
- For general command line Help, type: `help command line`
- For more information about a specific command, type help followed by the command. For example: `help set network or help admin firmware`
- For information about the current release, type: `help release`

Tips

- Type enough characters to identify the action, category, or parameter name uniquely. For parameter values, type the entire value. For example, you can shorten:

  ```
  set network port 1 state static ipaddr 122.3.10.1 mask 255.255.0.0
  ```

  to

  ```
  se net po 1 st static ip 122.3.10.1 ma 255.255.0.0
  ```

- Use the **Tab** key to automatically complete action, category, or parameter names. Type a partial name and press **Tab** either to complete the name if only one is possible, or to display the possible names if more than one is possible. Following a space after the preceding name, Tab displays all possible names.
- Should you make a mistake while typing, backspace by pressing the **Backspace** key and/or the Delete key, depending on how you accessed the interface. Both keys work if you use VT100 emulation in your terminal access program when connecting to the console port. Use the left and right arrow keys to move within a command.

- Use the **up** and **down arrows** to scroll through previously entered commands. If desired, select one and edit it. You can scroll through up to 100 previous commands entered in the session.
- To clear an IP address, type 0.0.0.0, or to clear a non-IP address value, type `CLEAR`.

  When the number of lines displayed by a command exceeds the size of the window (the default is 25), the command output is halted until the user is ready to continue. To display the next line, press **Enter**, and to display the page, press the space bar. You can override the number of lines (or disable the feature altogether) with the `set cli` command.

General CLI Commands

The following commands relate to the CLI itself.

To configure the current command line session:

```
set cli scscommands <enable|disable>
```

Allows you to use SCS-compatible commands as shortcuts for executing commands:

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

SCS Commands	SLC Commands
`info`	`'show sysstatus'`
`version`	`'admin version'`
`reboot`	`'admin reboot'`
`poweroff`	`'admin shutdown'`
`listdev`	`'show deviceport names'`
`direct`	`'connect direct deviceport'`
`listen`	`'connect listen deviceport'`
`clear`	`'set locallog clear'`
`telnet`	`'connect direct telnet'`
`ssh`	`'connect direct ssh'`

To set the number of lines displayed by a command:

```
set cli terminallines <disable|Number of lines>
```

Sets the number of lines in the terminal emulation (screen) for paging through text one screenful at a time, if the SLC console manager cannot detect the size of the terminal automatically.

To show current CLI settings:

```
show cli
```

To view the last 100 commands entered in the session:

```
show history
```

To clear the command history:

```
set history clear
```

To view the rights of the currently logged-in user:

```
show user
```

Note: *For information about user rights, see Chapter 12: User Authentication.*

6: Basic Parameters

This chapter explains how to set the following basic configuration settings for the SLC console manager using the SLC web interface or the CLI:

- Network parameters that determine how the SLC unit interacts with the attached network
- Firewall and routing
- Date and time

Note: *If you entered some of these settings using a Quick Setup procedure, you may update them here. The features and functionality described in this chapter specific to PC Card use are supported on SLC -02 part numbers. The features and functionality specific to USB port use are supported on SLC -03 part numbers.*

Requirements

If you assign a different IP address from the current one, it must be within a valid range, unique to your network, and with the same subnet mask as your workstation.

To configure the unit, you need the following information:

Eth1 IP address: ________ - ________ - ________ - ________

Subnet mask: ________ - ________ - ________ - ________

Eth2 IP address (optional): ________ - ________ - ________ - ________

Subnet mask (optional): ________ - ________ - ________ - ________

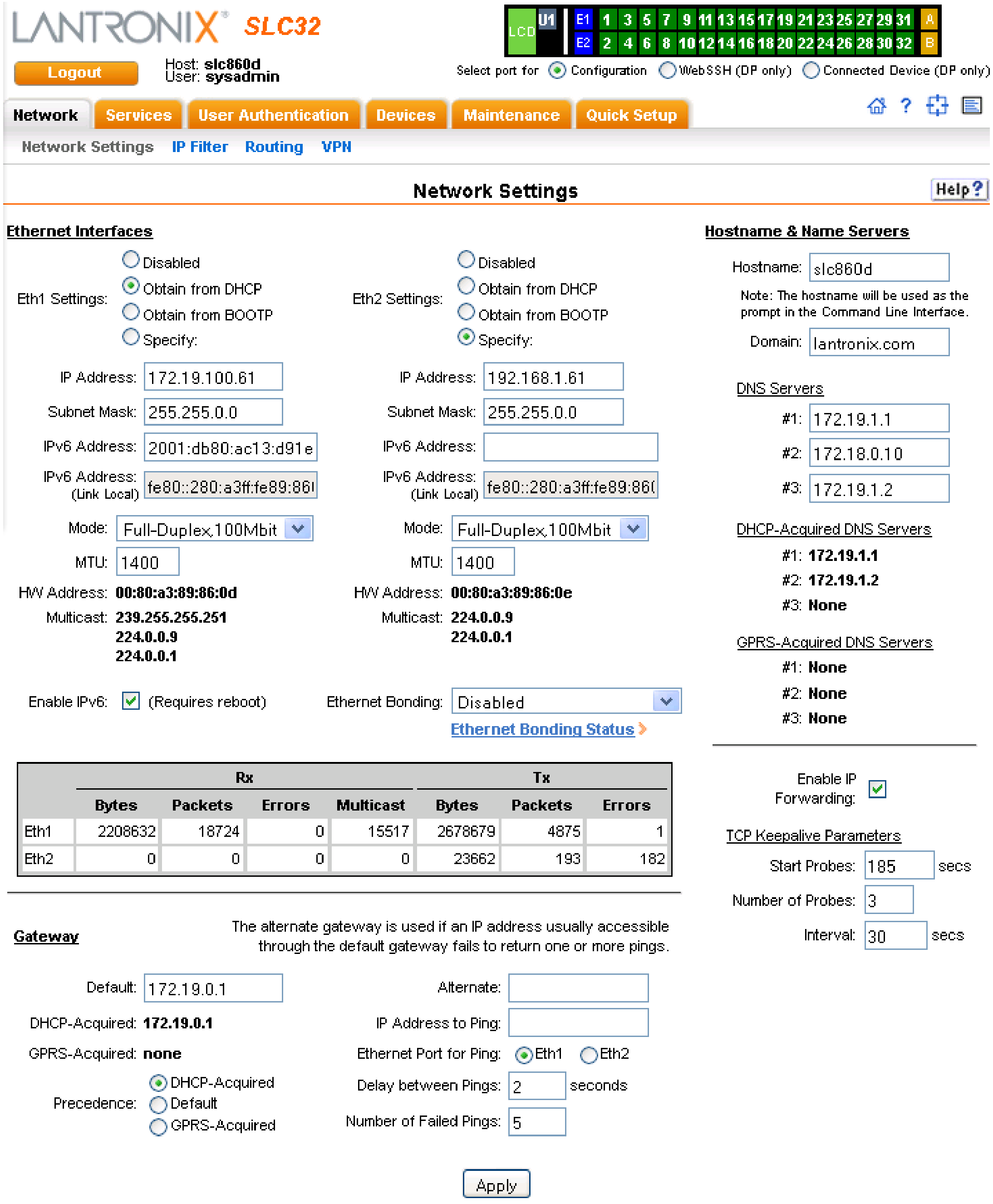
Gateway: ___________ - ___________ - ___________ - ___________

DNS: ___________ - ___________ - ___________ - ___________

To enter settings for one or both network ports:

1. Click the **Network** tab and select the **Network Settings** option. The following page displays:

Figure 6-1 Network > Network Settings


LANTRONIX SLC32
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Logout
Network Services User Authentication Devices Maintenance Quick Setup
Network Settings IP Filter Routing VPN
Help ?
Apply

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Network Settings

Ethernet Interfaces

Eth1 Settings: ○ Disabled ● Obtain from DHCP ○ Obtain from BOOTP ○ Specify:

IP Address: 172.19.100.61
Subnet Mask: 255.255.0.0
IPv6 Address: 2001:db80:ac13:d91e
IPv6 Address: (Link Local) fe80::280:a3ff:fe89:86
Mode: Full-Duplex,100Mbit
MTU: 1400
HW Address: 00:80:a3:89:86:0d
Multicast: 239.255.255.251
224.0.0.9
224.0.0.1

Eth2 Settings: ○ Disabled ○ Obtain from DHCP ○ Obtain from BOOTP ● Specify:

IP Address: 192.168.1.61
Subnet Mask: 255.255.0.0
IPv6 Address:
IPv6 Address: (Link Local) fe80::280:a3ff:fe89:86(
Mode: Full-Duplex,100Mbit
MTU: 1400
HW Address: 00:80:a3:89:86:0e
Multicast: 224.0.0.9
224.0.0.1

Enable IPv6: ☑ (Requires reboot)

Ethernet Bonding: Disabled

Ethernet Bonding Status >

	Rx				Tx		
	Bytes	Packets	Errors	Multicast	Bytes	Packets	Errors
Eth1	2208632	18724	0	15517	2678679	4875	1
Eth2	0	0	0	0	23662	193	182

Hostname & Name Servers

Hostname: slc860d

Note: The hostname will be used as the prompt in the Command Line Interface.

Domain: lantronix.com

DNS Servers
#1: 172.19.1.1
#2: 172.18.0.10
#3: 172.19.1.2

DHCP-Acquired DNS Servers
#1: 172.19.1.1
#2: 172.19.1.2
#3: None

GPRS-Acquired DNS Servers
#1: None
#2: None
#3: None

Enable IP Forwarding: ☑

TCP Keepalive Parameters
Start Probes: 185 secs
Number of Probes: 3
Interval: 30 secs

Gateway

The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

Default: 172.19.0.1
DHCP-Acquired: 172.19.0.1
GPRS-Acquired: none
Precedence: ● DHCP-Acquired ○ Default ○ GPRS-Acquired

Alternate:
IP Address to Ping:
Ethernet Port for Ping: ● Eth1 ○ Eth2
Delay between Pings: 2 seconds
Number of Failed Pings: 5

2. Enter the following information:

Eth1 and Eth2 Settings

Note: *Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.*

Eth 1 Settings or **Eth 2 Settings**	◆ **Disabled:** If selected, disables the network port. ◆ **Obtain from DHCP:** Acquires IP address, subnet mask, hostname and gateway from the DHCP server. (The DHCP server may not provide the hostname gateway, depending on its setup.) This is the default setting. If you select this option, skip to Gateway. ◆ **Obtain from BOOTP:** Lets a network node request configuration information from a BOOTP "server" node. If you select this option, skip to Gateway. ◆ **Specify:** Lets you manually assign a static IP address, generally provided by the system administrator.
IP Address (if specifying)	◆ Enter an IP address that will be unique and valid on your network. There is no default. ◆ Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is 172.19.201.28, do not enter 028 for the last segment. ***Note:*** *Currently, the SLC device does not support configurations with the same IP subnet on multiple interfaces (Ethernet or PPP).*
Subnet Mask	If specifying an IP address, enter the network segment on which the SLC resides. There is no default.
IPv6 Address	Address of the port in IPv6 format. ***Note:*** *The SLC unit upports IPv6 connections for a limited set of services: the web, SSH, and Telnet.* IPv6 addresses are written as 8 sets of 4-digit hexadecimal numbers separated by colons. There are several rules for modifying the address. For example: `1234:0BCD:1D67:0000:0000:8375:BADD:0057` may be shortened to `1234:BCD:1D67::8375:BADD:57.`
IPv6 Address (Link Local)	An IPv6 address that is intended only for communications within the segment of a local network.
Mode	Select the direction (full duplex or half-duplex) and speed (10 or 100Mbit) of data transmission. The default is Auto, which allows the Ethernet port to auto-negotiate the speed and duplex with the hardware endpoint to which it is connected.
MTU	Displays the multicast address of the Ethernet port.
Enable IPv6	Select this box to enable the IPv6 protocol. Disabled by default.
Ethernet Bonding	Ethernet 1 and Ethernet 2 can be bonded to support redundancy (Active Backup), aggregation (802.3ad), and load balancing. Disabled by default. Note that if Ethernet Bonding is enabled, assigning individual IP Addresses to Device Ports is not supported.

Note: Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.

Gateway

Default	IP address of the router for this network. If this has not been set manually, any gateway acquired by DHCP for Eth1 or Eth2 displays. All network traffic that matches the Eth1 IP address and subnet mask is sent out Eth1. All network traffic that matches the Eth2 IP address and subnet mask is sent out Eth 2. If you set a default gateway, any network traffic that does not match Eth1 or Eth2 is sent to the default gateway for routing.
DHCP-Acquired	Gateway acquired by DHCP for Eth1 or Eth2. View only.
GPRS-Acquired	Displays the IP address of the router if it has been automatically assigned by General Packet Radio Service (GPRS). View only.
Precedence	Indicates whether the gateway acquired by DHCP or the default gateway takes precedence. The default is DHCP Gateway. If the DHCP Gateway is selected and both Eth1 and Eth2 are configured for DHCP, the SLC console manager gives precedence to the Eth1 gateway.
Alternate	An alternate IP address of the router for this network, to be used if an IP address usually accessible through the default gateway fails to return one or more pings.
IP Address to Ping	IP address to ping to determine whether to use the alternate gateway.
Ethernet Port to Ping	Ethernet port to use for the ping.
Delay between Pings	Number of seconds between pings
Number of Failed Pings	Number of pings that fail before the SLC unit uses the alternate gateway.
Enable IP Forwarding	IP forwarding enables network traffic received on one interface (Eth1, Eth2, or an external/USB modem attached to the SLC device with an active PPP connection) to be transferred out another interface (any of the above). The default behavior (if IP forwarding is disabled) is for network traffic to be received but not routed to another destination. Enabling IP forwarding is required if you enable Network Address Translation (NAT) for any device port modem or USB/ISDN modem. IP forwarding allows a user accessing the SLC console manager over a modem to access the network connected to Eth1 or Eth2.

Hostname & Name Servers

Hostname	The default host name is `slcXXXX`, where `XXXX` is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). The host name becomes the prompt in the command line interface.
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC unit. For example, if abcd is specified for the SMTP server, and **mydomain.com** is specified for the domain, if **abcd** cannot be resolved, the SLC device attempts to resolve **abcd.mydomain.com** for the SMTP server.

DNS Servers

DNS Servers #1 - #3	Configure up to three name servers. #1 is required if you choose to configure DNS (Domain Name Server) servers. The first three DNS servers acquired via DHCP through Eth1 and/or Eth2 display automatically.

DHCP-Acquired DNS Servers

#1 - #3	Displays the IP address of the name servers if automatically assigned by DHCP.

GPRS-Acquired DNS Servers

#1 - #3	Displays the IP address of the name servers if automatically assigned by General Packet Radio Service (GPRS).

TCP Keepalive Parameters

Start Probes	Number of seconds the SLC console manager waits after the last transmission before sending the first probe to determine whether a TCP session is still alive. The default is 600 seconds (10 minutes).
Number of Probes	Number of probes the SLC unit sends before closing a session. The default is 5.
Interval	The number of seconds the SLC device waits between probes. The default is 60 seconds.

3. To save your entries, click the **Apply** button. **Apply** makes the changes immediately and saves them so they will be there when the SLC console manager is rebooted.

Ethernet Counters

The *Network > Network Settings* page displays statistics for each of the SLC unit's Ethernet ports since boot-up. The system automatically updates them.

Note: *For Ethernet statistics for a smaller time period, use the* `diag perfstat` *command.*

Network Commands

The following CLI commands correspond to the web page entries described above.

To configure Ethernet port 1 or 2:

```
set network port <1|2> <parameters>
```

Parameters:

```
mode <auto|10mbit-half|100mbit-half|
10mbit-full|100mbit-full>
state <dhcp|bootp|static|disable>
[ipaddr <IP Address> mask <Mask>]
[ipv6addr <IP v6 Address|Prefix>]
```

To configure up to three DNS servers:

```
set network dns <1|2|3> ipaddr <IP Address>
```

To set the default and alternate network gateways:

```
set network gateway <parameters>
```

Parameters:

```
default <IP Address>
precedence <dhcp|gprs|default>
alternate <IP Address>
pingip <IP Address>
ethport <1 or 2>
pingdelay <1-250 seconds>
failedpings <1-25>
```

The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

To set the SLC host name and domain name:

```
set network host <Hostname> [domain <Domain Name>]
```

To set TCP Keepalive and IP Forwarding network parameters:

```
set network <parameters>
```

Parameters:

```
interval <1-99999 Seconds>
ipforwarding <enable|disable>
probes <Number of Probes>
startprobes <1-99999 Seconds>
```

To view all network settings:

```
show network all
```

To view Ethernet port settings and counters:

```
show network port <1|2>
```

To view DNS settings:

```
show network dns
```

To view gateway settings:

```
show network gateway
```

To view the host name of the SLC unit:

```
show network host
```

IP Filter

IP filters (also called a rule set) act as a firewall to allow or deny individual or a range of IP addresses, ports, and protocols. When a network connection is configured to use an IP filter, all network traffic through that connection is compared, in order, to the rules of that filter. Network traffic may be allowed to pass, it may be dropped (without notice), or it may be rejected (sends back an error packet) depending upon the rules of that filter rule set.

The administrator uses the *Network > IP Filter* page to view, add, edit, delete, and map IP filters,

Warning: ***IP filters configuration is a feature for advanced users. Adding and enabling IP filter sets incorrectly can disable your SLC console manager.***

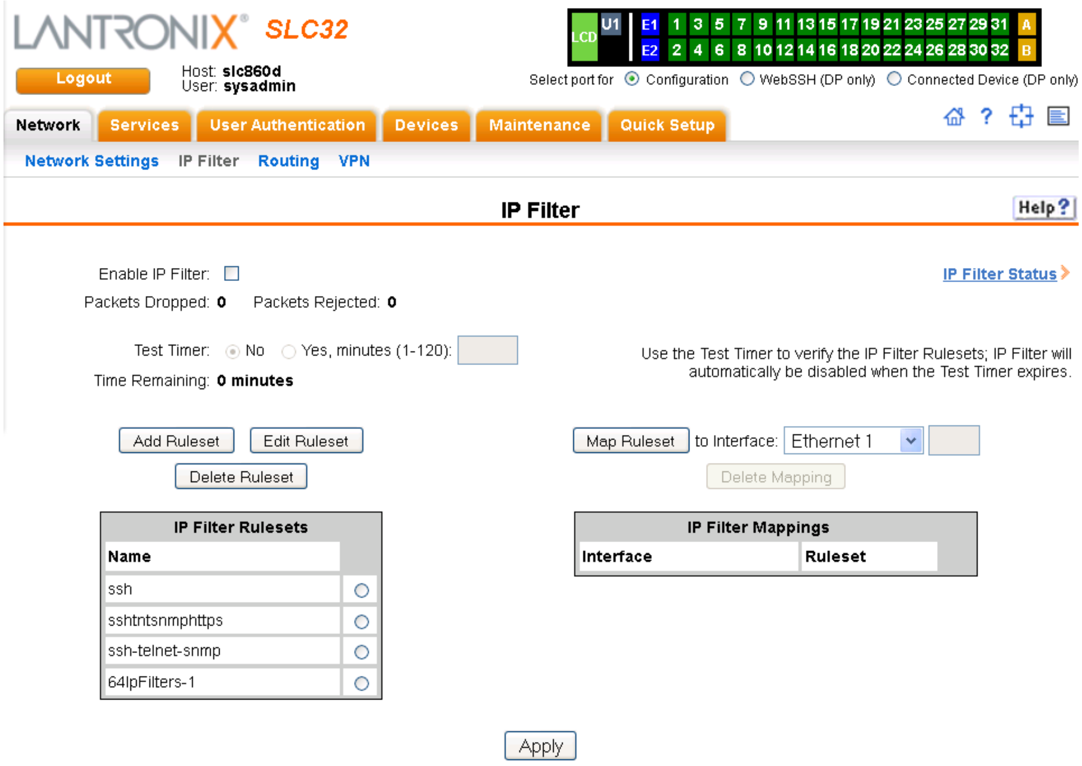
Viewing IP Filters

You can view a list of filters and a table showing how each filter is mapped to an interface.

To view a list of IP filters:

1. Click the **Network** tab and select the **IP Filter** option. The following page displays:

Figure 6-2 Network > IP Filter



Host: **slc860d**
User: **sysadmin**

IP Filter

Enable IP Filter: ☐

Packets Dropped: **0** Packets Rejected: **0**

Test Timer: ● No ○ Yes, minutes (1-120):

Time Remaining: **0 minutes**

Use the Test Timer to verify the IP Filter Rulesets; IP Filter will automatically be disabled when the Test Timer expires.

Map Ruleset to Interface: Ethernet 1

IP Filter Rulesets

Name	
ssh	○
sshtntsnmphttps	○
ssh-telnet-snmp	○
64IpFilters-1	○

IP Filter Mappings

Interface	Ruleset

Enabling IP Filters

On the *Network > IP Filter* page, you can enable all filters or disable all filters.

Note: *There is no way to enable or disable individual filters.*

To enable IP filters:

1. Enter the following:

Enable IP Filter	Select the **Enable IP Filter** checkbox to enable all filters, or clear the checkbox to disable all filters. Disabled by default.
Packets Dropped	Displays the number of data packets that the filter ignored (did not respond to). View only.
Packets Rejected	Displays the number of data packets that the filter sent a “rejected” response to. View only.
Test Timer	Timer for testing IP Filter rulesets. Select No to disable the timer. Select Yes, minutes (1-120) to enable the timer and enter the number of minutes the timer should run. The timer automatically disables the IP Filters when the time expires.
Time Remaining	Indicates how many minutes are left on the timer before it expires and IP Filters disabled. View only.

Configuring IP Filters

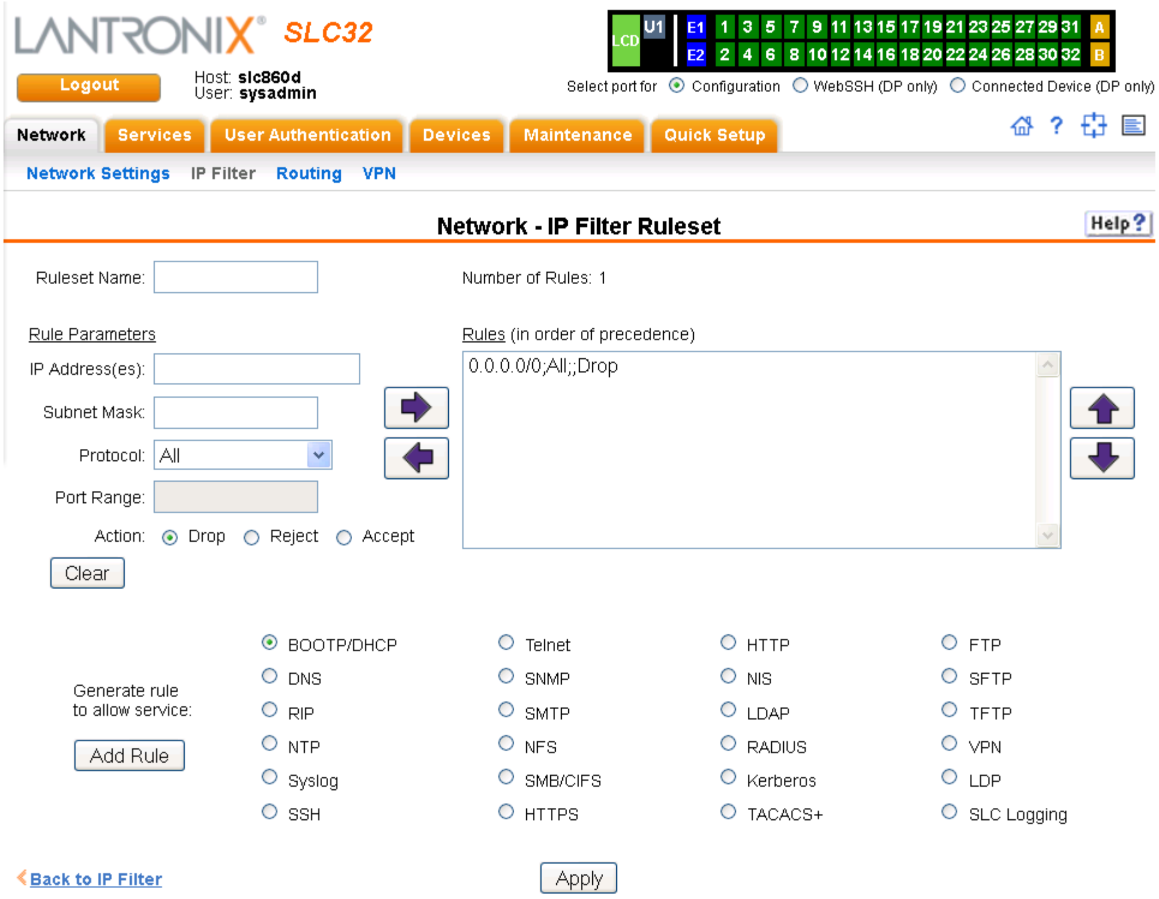
The administrator can add, edit, delete, and map IP filters.

Note: *A configured filter has no effect until it is mapped to a network interface. See Mapping a Ruleset on page 62.*

To add an IP filter:

1. On the *Network > IP Filter* page, click the **Add Ruleset** button. The following page displays:

Figure 6-3 Network > IP Filter Ruleset (Adding/Editing Rulesets)



LANTRONIX SLC32
Logout
Host: slc860d
User: sysadmin
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
Network Settings IP Filter Routing VPN
Help ?

Network - IP Filter Ruleset

Ruleset Name:

Number of Rules: 1

Rule Parameters

IP Address(es):

Subnet Mask:

Protocol: All

Port Range:

Action: ● Drop ○ Reject ○ Accept

Clear

Rules (in order of precedence)

0.0.0.0/0;All;;Drop

Generate rule to allow service:

Add Rule

● BOOTP/DHCP	○ Telnet	○ HTTP	○ FTP
○ DNS	○ SNMP	○ NIS	○ SFTP
○ RIP	○ SMTP	○ LDAP	○ TFTP
○ NTP	○ NFS	○ RADIUS	○ VPN
○ Syslog	○ SMB/CIFS	○ Kerberos	○ LDP
○ SSH	○ HTTPS	○ TACACS+	○ SLC Logging

Back to IP Filter

Apply

Rulesets can be added or updated on this page.

2. Enter the following:

Ruleset Name	Name that identifies a filter; may be composed of letters, numbers, and hyphens only. (The name cannot start with a hyphen.) Example: `FILTER-2`

Rule Parameters

IP Address(es)	Specify a single IP address to act as a filter or specify a range of IP addresses if the range cannot be defined by an IP address and Subnet Mask. Example: ◆ `172.19.220.64` – this specific IP address only ◆ `172.19.220.60:172.19.220.68` - a range of IP addresses from `172.19.220.60` through `172.19.220.68`.
Subnet Mask	Specify a subnet mask to act determine how much of the address should apply to the filter. Example: `255.255.255.255` to specify the whole address should apply.
Protocol	From the drop-down list, select the type of protocol through which the filter will operate. The default setting is All.

Port Range	Enter a range of destination TCP or UDP port numbers to be tested. An entry is required for TCP, TCP New, TCP Established, and UDP, and is not allowed for other protocols. Separate multiple ports with commas. Separate ranges of ports by colons. Examples: ◆ 22 – filter on port 22 only ◆ 23,64,80 – filter on ports 23, 64 and 80 ◆ 23:64,80,143:150 – filter on ports 23 through 64, port 80 and ports 143 through 150
Action	Select whether to **Drop**, **Reject**, or **Accept** communications for the specified IP address, subnet mask, protocol, and port range. Drop ignores the packet with no notification. Reject ignores the packet and sends back an error message. Allow permits the packet through the filter.
Generate rule to allow service	You may wish to "punch holes" in your filter set for a particular protocol or service. For instance, if you have configured your NIS server and wish to create an opening in your filter set, select the NIS option and click the **Add Rule** button. This entry adds a new rule to your filter set using the NIS -configured IP address. Other services and protocols added automatically generate the necessary rule to allow their use.

3. Click the right arrow ➡ button to add the new rule to the bottom of the Rules list box on the right. A maximum of 64 rules can be created for each ruleset.

4. To remove a rule from the filter set, highlight that line and click the left ⬅ arrow. The rule populates the rule definition fields, allowing you to make minor changes before reinserting the rule. To clear the definition fields, click the **Clear** button.

5. To change the order of priority of the rules in the list box, select the rule to move and use the up ⬆ or down ⬇ arrow buttons on the right side of the filter list box.

6. To save, click the **Apply** button. The new filter displays in the menu tree.

Note: *To add another new filter rule set, click the **Back to IP Filter** link to return to the Network > IP Filter page.*

Updating an IP Filter

To update an IP filter rule set:

1. From the *Network > IP Filter* page, the administrator selects the IP filter ruleset to be edited and clicks the **Edit Ruleset** button to return to the *Network > IP Filter Ruleset (Adding/Editing Rulesets)* page (see *Figure 6-3*).
2. Edit the information as desired and click the **Apply** button.

Deleting an IP Filter

To delete an IP filter rule set:

1. On the *Network > IP Filter* page, the administrator selects the IP filter ruleset to be deleted and clicks the **Delete Ruleset** button.

Mapping a Ruleset

The administrator can assign an IP Filter Ruleset to a network interface (Ethernet interface) a modem connected to a Device Port.

To map a rule set to a network interface:

1. On the *Network > IP Filter* page, select the IP filter ruleset to be mapped.
2. From the Interface drop-down list, select the interface and click the **Map Ruleset** button. The Interface and rule set display in the IP Filter Mappings table.

To delete a mapping:

1) On the *Network > IP Filter* page, select the mapping from the list and click the **Delete Mapping** button. The mapping no longer displays.

2) Click the **Apply** button.

IP Filter Commands

The following CLI commands correspond to the web page entries described above.

To enable or disable IP filtering for incoming network traffic:

```
set ipfilter state
```

To set IP filter mapping:

```
set ipfilter mapping <parameters>
```

Parameters:

```
ethernet <1|2> state <disable>
ethernet <1|2> state <enable> ruleset <Ruleset Name>
deviceport <1..48> state <disable>
deviceport <1..48> state <enable> ruleset <Ruleset Name>
```

```
 state <disable>
 state <enable> ruleset <Ruleset Name>
```

To set IP filter rules:

```
set ipfilter rules <parameters>
```

Parameters:

```
add <Ruleset Name>
delete <Ruleset Name>
edit <Ruleset Name> <Edit Parameters>
```

Edit Parameters:

```
append
insert <Rule Number>
replace <Rule Number>
delete <Rule Number>
```

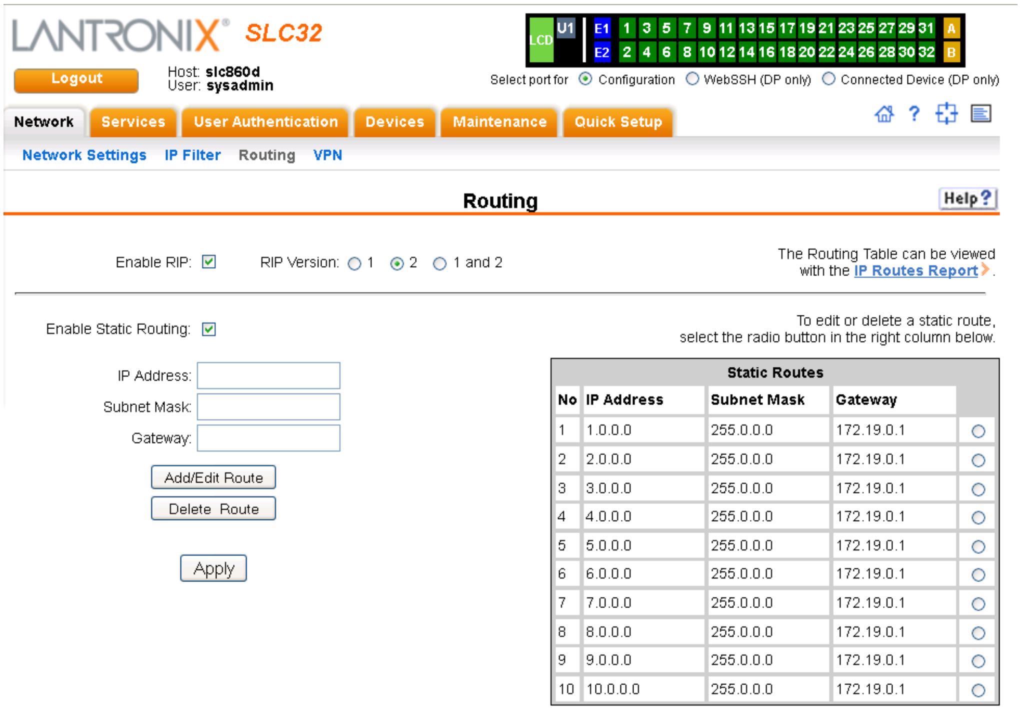
Routing

The SLC console manager allows you to define static routes and, for networks using Routing Information Protocol (RIP)-capable routes, to enable the RIP protocol to configure the routes dynamically.

To configure routing settings:

1. Click the **Network** tab and select the **Routing** option. The following page displays:

Figure 6-4 Network > Routing



Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Enable RIP: ☑ RIP Version: ○ 1 ● 2 ○ 1 and 2

The Routing Table can be viewed with the IP Routes Report.

Enable Static Routing: ☑

To edit or delete a static route, select the radio button in the right column below.

IP Address:

Subnet Mask:

Gateway:

Static Routes

No	IP Address	Subnet Mask	Gateway	
1	1.0.0.0	255.0.0.0	172.19.0.1	○
2	2.0.0.0	255.0.0.0	172.19.0.1	○
3	3.0.0.0	255.0.0.0	172.19.0.1	○
4	4.0.0.0	255.0.0.0	172.19.0.1	○
5	5.0.0.0	255.0.0.0	172.19.0.1	○
6	6.0.0.0	255.0.0.0	172.19.0.1	○
7	7.0.0.0	255.0.0.0	172.19.0.1	○
8	8.0.0.0	255.0.0.0	172.19.0.1	○
9	9.0.0.0	255.0.0.0	172.19.0.1	○
10	10.0.0.0	255.0.0.0	172.19.0.1	○

2. Enter the following:

Dynamic Routing

Enable RIP	Select to enable **Dynamic Routing Information Protocol (RIP)** to assign routes automatically. Disabled by default.
RIP Version	Select the **RIP** version. The default is **2**.

Static Routing

Enable Static Routing	Select to assign the routes manually. The system administrator usually provides the routes. Disabled by default. ◆ To add a static route, enter the **IP Address**, **Subnet Mask**, and **Gateway** for the route and click the **Add/Edit Route** button. The route displays in the Static Routes table. You can add up to 64 static routes. ◆ To edit a static route, select the radio button to the right of the route, change the **IP Address**, **Subnet Mask**, and **Gateway** fields as desired, and click the **Add/Edit Route** button. ◆ To delete a static route, select the radio button to the right of the route and click the **Delete Route** button.

3. Click the **Apply** button.

Note: *To display the routing table, status or specific report, see the section, Status/Reports on page 234.*

Equivalent Routing Commands

The following CLI commands correspond to the web page entries described above.

To configure static or dynamic routing:

```
set routing [parameters]
```

Parameters:

```
rip <enable|disable>
route <1-64> ipaddr <IP Address> mask <Netmask> gateway <IP Address>
static <enable|disable>
version <1|2|both>
```

Note: *To delete a static route, set the IP address, mask, and gateway parameters to 0.0.0.0.*

To set the routing table to display IP addresses (disable) or the corresponding host names (enable):

```
show routing [resolveip <enable|disable>] [email <Email Address>]
```

Note: *You can optionally email the displayed information.*

VPN

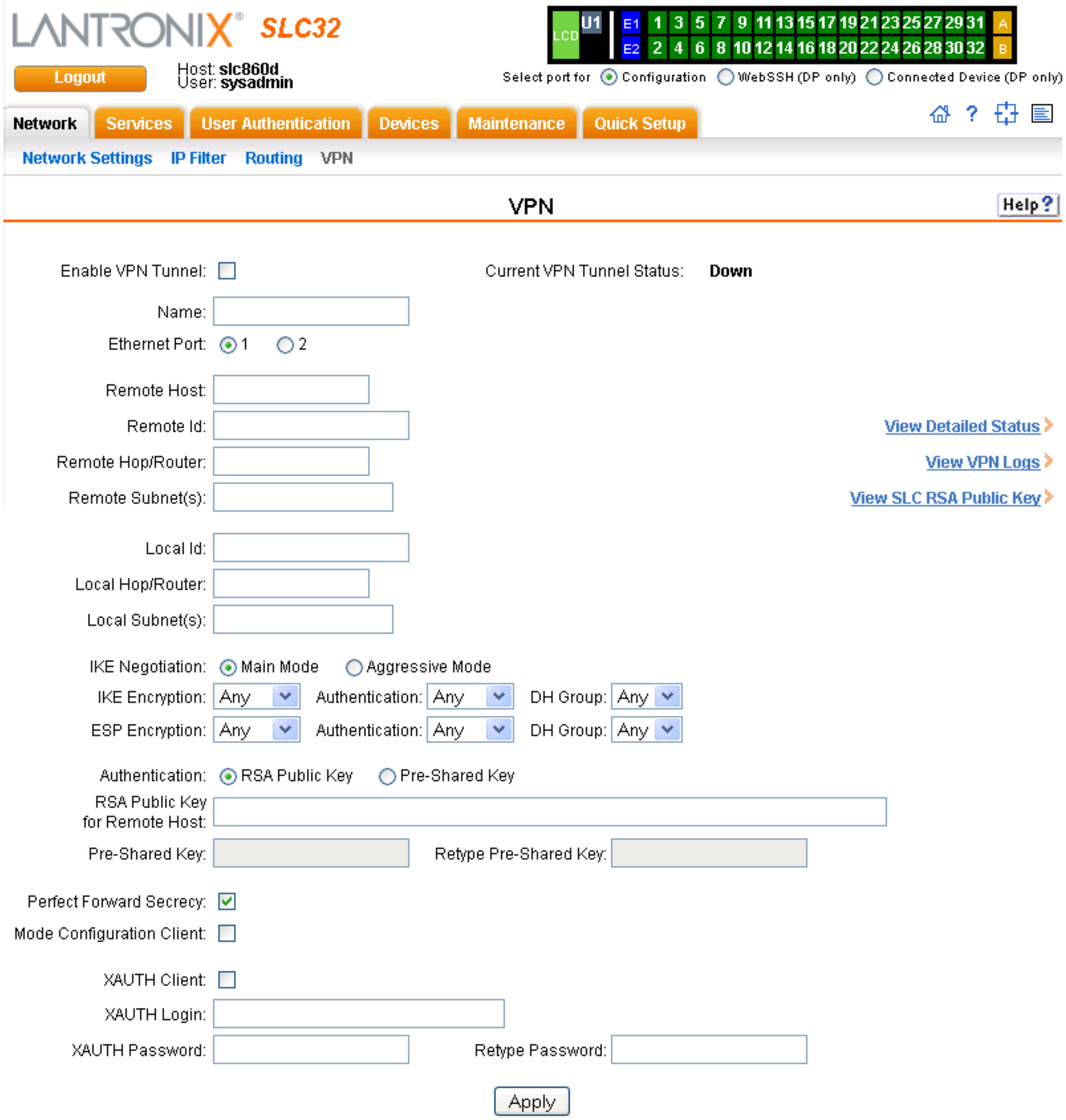
This page can be used to create a Virtual Private Network (VPN) tunnel to the SLC console manager for secure communication between the SLC unit and a remote host or gateway. The SLC device supports IPSec tunnels using Encapsulated Security Payload (ESP). The SLC console manager supports host-to-host, net-to-net, host-to-net, and roaming user tunnels.

Note: *To allow VPN tunnel access if the SLC firewall is enabled, traffic to UDP ports 500 and 4500 from the remote host should be allowed, as well as protocol ESP from the remote host.*

To complete the VPN page:

1. Click the **Network** tab and select the **VPN** option. The following page displays:

Figure 6-5 Network > VPN



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

VPN

Enable VPN Tunnel: □

Current VPN Tunnel Status: **Down**

Name:

Ethernet Port: ● 1 ○ 2

Remote Host:

Remote Id:

Remote Hop/Router:

Remote Subnet(s):

Local Id:

Local Hop/Router:

Local Subnet(s):

IKE Negotiation: ● Main Mode ○ Aggressive Mode

IKE Encryption: Any Authentication: Any DH Group: Any

ESP Encryption: Any Authentication: Any DH Group: Any

Authentication: ● RSA Public Key ○ Pre-Shared Key

RSA Public Key for Remote Host:

Pre-Shared Key: Retype Pre-Shared Key:

Perfect Forward Secrecy: ☑

Mode Configuration Client: □

XAUTH Client: □

XAUTH Login:

XAUTH Password: Retype Password:

2. Enter the following:

Enable VPN Tunnel	Select to create a tunnel.
Name	The name assigned to the tunnel. Required to create a tunnel.
Ethernet Port	Select ethernet port 1 or 2.
Remote Host	The IP address of the remote host's public network interface. The special value of **any** can be entered if the remote host is a roaming user who may not have the same IP address each time a tunnel is created. In this case, it is recommended that the **Remote Id** also be configured.
Remote Id	How the remote host should be identified for authentication. The Id is used to select the proper credentials for communicating with the remote host.
Remote Hop/Router	If the remote host is behind a gateway, this specifies the IP address of the gateway's public network interface.
Remote Subnet(s)	One or more subnets behind the remote host, expressed in CIDR notation (IP address/mask bits). If multiple subnets are specified, the subnets should be separated by a comma.
Local Id	How the SLC console manager should be identified for authentication. The Id is used by the remote host to select the proper credentials for communicating with the SLC device.
Local Hop/ Router	If the SLC console manager is behind a gateway, this specifies the IP address of the gateway's public network interface.
Local Subnet(s)	One or more subnets behind the SLC unit, expressed in CIDR notation (IP address/mask bits). If multiple subnets are specified, the subnets should be separated by a comma.
IKE Negotiation	The Internet Key Exchange (IKE) protocol is used to exchange security options between two hosts who want to communicate via IPSec. The first phase of the protocol authenticates the two hosts to each other and establishes the Internet Security Association Key Management Protocol Security Association (ISAKMP SA). The second phase of the protocol establishes the cryptographic parameters for protecting the data passed through the tunnel, which is the IPSec Security Association (IPSec SA). The IPSec SA can periodically be renegotiated to ensure security. The IKE protocol can use one of two modes: Main Mode, which provides identity protection and takes longer, or Aggressive Mode, which provides no identity protection but is quicker. With Aggressive Mode, there is no negotiation of which cryptographic parameters will be used; each side must give the correct cryptographic parameters in the initial package of the exchange, otherwise the exchange will fail. If Aggressive Mode is used, the **IKE Encryption**, **IKE Authentication**, and **IKE DH Group** must be specified.
IKE Encryption	The type of encryption, **3DES** or **AES**, used for IKE negotiation. **Any** can be selected if the two sides can negotiate which type of encryption to use.
Authentication (Ike)	The type of authentication, **SHA1** or **MD5**, used for IKE negotiation. **Any** can be selected if the two sides can negotiate which type of authentication to use.
DH Group (Ike)	The Diffie-Hellman Group, **2** or **5**, used for IKE negotiation. **Any** can be selected if the two sides can negotiate which Diffie-Hellman Group to use.
ESP Encryption	The type of encryption, **3DES** or **AES**, used for encrypting the data sent through the tunnel. **Any** can be selected if the two sides can negotiate which type of encryption to use.
Authentication (Ike)	The type of authentication, **SHA1** or **MD5**, used for authenticating data sent through the tunnel. **Any** can be selected if the two sides can negotiate which type of authentication to use.

DH Group (Ike)	The Diffie-Hellman Group, **2** or **5**, used for the key exchange for data sent through the tunnel. **Any** can be selected if the two sides can negotiate which Diffie-Hellman Group to use.
Authentication	The type of authentication used by the host on each side of the VPN tunnel to verify the identity of the other host. For **RSA Public Key**, each host generates a RSA public-private key pair, and shares its public key with the remote host. The RSA Public Key for the SLC unit (which has 2192 bits) can be viewed at either the web or CLI. For **Pre-Shared Key**, each host enters the same passphrase to be used for authentication.
RSA Public Key for Remote Host	If **RSA Public Key** is selected for authentication, enter the public key for the remote host.
Pre-Shared Key	If **Pre-Shared Key** is selected for authentication, enter the key.
Retype Pre-Shared Key	If **Pre-Shared Key** is selected for authentication, re-enter the key.
Perfect Forward Secrecy	When a new IPSec SA is negotiated after the IPSec SA lifetime expires, a new Diffie-Hellman key exchange can be performed to generate a new session key to be used to encrypt the data being sent through the tunnel. If this is enabled, it provides greater security, since the old session keys are destroyed.
Mode Configuration Client	If this is enabled, the SLC console manager can receive network configuration from the remote host. This allows the remote host to assign an IP address/netmask to the SLC side of the VPN tunnel.
XAUTH Client	If this is enabled, the SLC unit will send authentication credentials to the remote host if they are requested. XAUTH, or Extended Authentication, can be used as an additional security measure on top of the Pre-Shared Key or RSA Public Key.
XAUTH Login (Client)	If **XAUTH Client** is enabled, this is the login used for authentication.
XAUTH Password	If **XAUTH Client** is enabled, this is the password used for authentication.
Retype Password	If **XAUTH Client** is enabled, this is the password used for authentication.

3. To save, click **Apply** button.
4. To see a details of the VPN tunnel connection, including the cryptographic algorithms used, select the **View Detailed Status** link.
5. To see the last 100 lines of the logs associated with the VPN tunnel, select the **View VPN Logs** link.
6. To see the RSA public key for the SLC console manager (required for configuring the remote host if RSA Public Keys are being used), select the **View SLC RSA Public Key** link.

7: Services

System Logging and Other Services

Use the *Services > SSH/Telnet/Logging* page to:

- Configure the amount of data sent to the logs.
- Enable or disable SSH and Telnet logins.
- Enable a Simple Network Management Protocol (SNMP) agent.

Note: *The SLC console manager supports both MIB-II (as defined by RFC 1213) and a private enterprise MIB. The private enterprise MIB provides read-only access to all statistics and configurable items provided by the SLC unit. It provides read-write access to a select set of functions for controlling the SLC device and device ports. See the MIB definition file for details.*

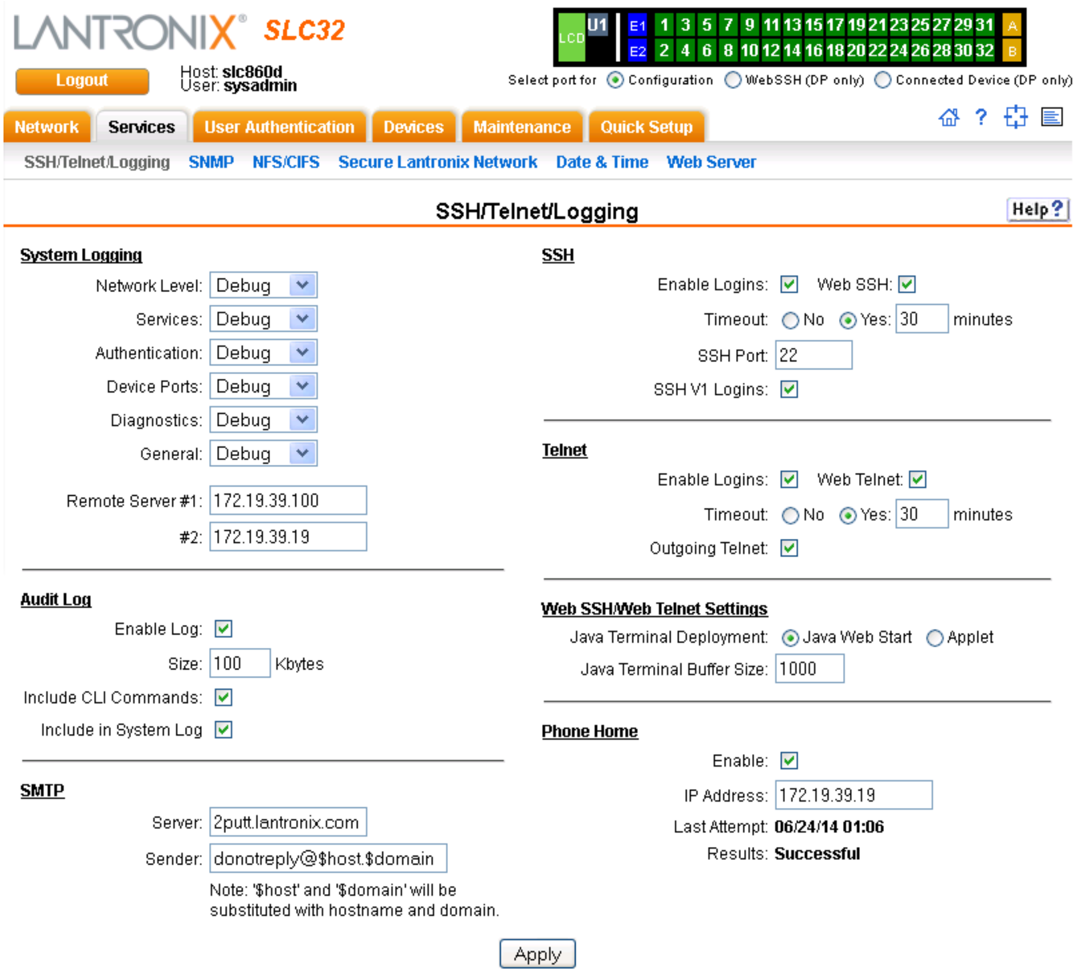
- Identify a Simple Mail Transfer Protocol (SMTP) server.
- Enable or disable SSH and Telnet logins.
- Configure an audit log.
- View the status of and manage the SLC console managers on the Secure Lantronix network.
- Set the date and time.

SSH/Telnet/Logging

To configure SSH, Telnet, and Logging settings:

1. Click the **Services** tab and select the **SSH/Telnet/Logging** option. The following page displays.

Figure 7-1 Services > SSH/Telnet/Logging


LANTRONIX SLC32
Host: slc860d
User: sysadmin
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
SSH/Telnet/Logging SNMP NFS/CIFS Secure Lantronix Network Date & Time Web Server
Help ?
Apply

SSH/Telnet/Logging

System Logging

Network Level: Debug
Services: Debug
Authentication: Debug
Device Ports: Debug
Diagnostics: Debug
General: Debug

Remote Server #1: 172.19.39.100
#2: 172.19.39.19

Audit Log

Enable Log: ☑
Size: 100 Kbytes
Include CLI Commands: ☑
Include in System Log ☑

SMTP

Server: 2putt.lantronix.com
Sender: donotreply@$host.$domain
Note: '$host' and '$domain' will be substituted with hostname and domain.

SSH

Enable Logins: ☑ Web SSH: ☑
Timeout: ○ No ● Yes: 30 minutes
SSH Port: 22
SSH V1 Logins: ☑

Telnet

Enable Logins: ☑ Web Telnet: ☑
Timeout: ○ No ● Yes: 30 minutes
Outgoing Telnet: ☑

Web SSH/Web Telnet Settings

Java Terminal Deployment: ● Java Web Start ○ Applet
Java Terminal Buffer Size: 1000

Phone Home

Enable: ☑
IP Address: 172.19.39.19
Last Attempt: **06/24/14 01:06**
Results: **Successful**

2. Enter the following settings:

System Logging

In the System Logging section, select one of the following alert levels from the drop-down list for each message category:

- **Off:** Disables this type of logging.
- **Error:** Saves messages that are output because of an error.
- **Warning:** Saves message output from a condition that may be cause for concern, in addition to error messages. This is the default for all message types.
- **Info:** Saves informative message, in addition to warning and error messages.
- **Debug:** Saves extraneous detail that may be helpful in tracking down a problem, in addition to information, warning, and error messages.

Network Level	Messages concerning the network activity, for example about Ethernet and routing.
Services	Messages concerning services such as SNMP and SMTP.
Authentication	Messages concerning user authentication.
Device Ports	Messages concerning device ports and connections.

Diagnostics	Messages concerning system status and problems.
General	Any message not in the categories above.
Remote Servers (#1 and #2)	IP address of the remote server(s) where system logs are stored. The system log is always saved to local SLC storage. It is retained through SLC unit reboots for files up to 200K. Saving the system log to a server that supports remote logging services (see RFC 3164) allows the administrator to save the complete system log history.

Audit Log

Enable Log	Select to save a history of all configuration changes in a circular log. Disabled by default. The audit log is saved through SLC console manager reboots.
Size	The log has a default maximum size of 50 Kbytes (approximately 500 entries). You can set the maximum size of the log from 1 to 500 Kbytes.
Include CLI Commands	Select to cause the audit log to include the CLI commands that have been executed. Disabled by default.
Include In System Log	If enabled, the contents of the audit log are added to the system log (under the General/Info category/level). Disabled by default.

SMTP

Server	IP address of your network's Simple Mail Transfer Protocol (SMTP) relay server.
Sender	The email address of the sender of outgoing emails. The strings "$host" and "$domain" can be part of the email address - they will be substituted with the actual hostname and domain. The default is donotreply@$host.$domain.

SSH

Enable Logins	Enables or disables SSH logins to the SLC unit to allow users to access the CLI using SSH. Enabled by default. This setting does not control SSH access to individual device ports. (See *Device Ports - Settings (on page 94)* for information on enabling SSH access to individual ports.) Most system administrators enable SSH logins, which is the preferred method of accessing the system.
Web SSH	Enables or disables the ability to access the SLC command line interface or device ports (connect direct) through the Web SSH window. Disabled by default.
Timeout	If you enable SSH logins, you can cause an idle connection to disconnect after a specified number of minutes. Select **Yes** and enter a value of from 1 to 30 minutes. ***Note:*** *You must reboot the unit before a change will take effect.*
SSH Port	Allows you to change the SSH login port to a different value in the range of 1 - 65535. The default is 22. ***Note:*** *You must reboot the unit before a change will take effect.*
SSH V1 Logins	Enables or disables SSH version 1 connections to the SLC console manager **Enabled** by default. ***Note:*** *Disabling SSH V1 blocks Web SSH CLI and Web SSH to device port connections on the Network > Network Settings page. Also, you must reboot the SLC before a change will take effect.*

Telnet

Enable Logins	Enables or disables Telnet logins to the SLC console manager to allow users to access the CLI using Telnet. Disabled by default. This setting does not control Telnet access to individual device ports. (See *Device Ports - Settings (on page 94)* for information on enabling Telnet access to individual ports.) You may want to keep this option disabled for security reasons.
Web Telnet	Enables or disables the ability to access the SLC command line interface or device ports (connect direct) through the Web Telnet window. Disabled by default.
Timeout	If you enable Telnet logins, you can cause an idle connection to disconnect after a specified number of minutes. Select **Yes** and enter a value of from 1 to 30 minutes. ***Note:*** *You must reboot the unit before a change will take effect.*
Outgoing Telnet	Enables or disables the ability to create Telnet out connections.

Web SSH/Web Telnet Settings

Java Terminal Deployment	Method used to launch Java applications, either Java Web Start or Applet.
Java Terminal Buffer Size	Number of lines in the Java terminal window that are available for scrolling back through output.

Phone Home

Enable	If enabled, allows SLC unit to directly contact an SLM and request addition to the database
IP Address	IP address of the SLM unit.
Last Attempt (view only)	Displays the date and time of last connection attempt.
Results (view only)	Indicates whether the SLC console manager successfully generated a phone home UDP packet. This status is not an acknowledgement of successful receipt by the SLM unit.

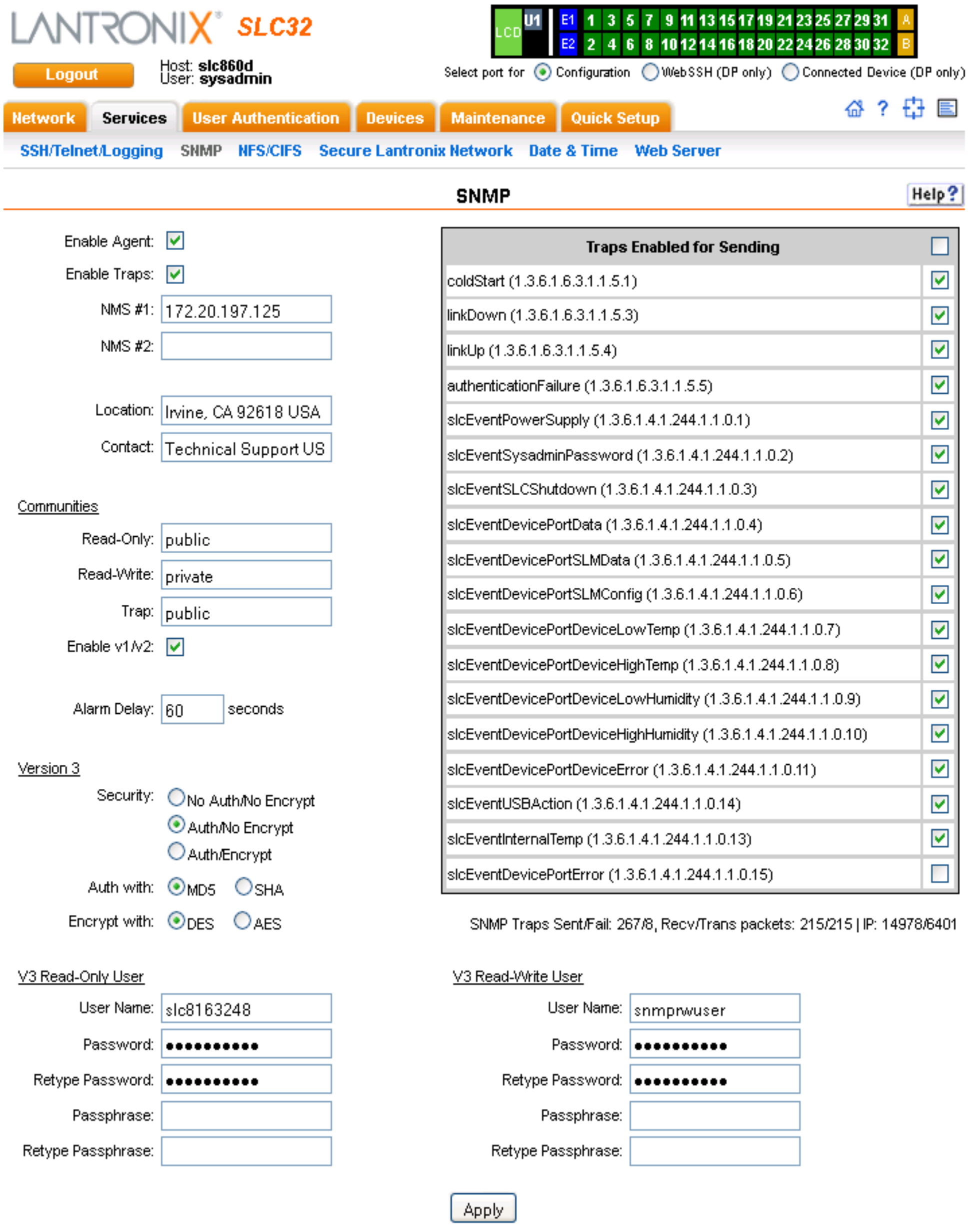
3. To save, click the **Apply** button.

SNMP

Simple Network Management Protocol (SNMP) is a set of protocols for managing complex networks.

1. Click the **Services** tab and select the **SNMP** option. The following page displays:

Figure 7-2 Services > SNMP


LANTRONIX SLC32
Logout
LCD U1 E1 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A
E2 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
SSH/Telnet/Logging SNMP NFS/CIFS Secure Lantronix Network Date & Time Web Server
Help ?
Apply

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

SNMP

Enable Agent: ☑

Enable Traps: ☑

NMS #1: 172.20.197.125

NMS #2:

Location: Irvine, CA 92618 USA

Contact: Technical Support US

Communities

Read-Only: public

Read-Write: private

Trap: public

Enable v1/v2: ☑

Alarm Delay: 60 seconds

Version 3

Security: ○ No Auth/No Encrypt ● Auth/No Encrypt ○ Auth/Encrypt

Auth with: ● MD5 ○ SHA

Encrypt with: ● DES ○ AES

Traps Enabled for Sending	□
coldStart (1.3.6.1.6.3.1.1.5.1)	☑
linkDown (1.3.6.1.6.3.1.1.5.3)	☑
linkUp (1.3.6.1.6.3.1.1.5.4)	☑
authenticationFailure (1.3.6.1.6.3.1.1.5.5)	☑
slcEventPowerSupply (1.3.6.1.4.1.244.1.1.0.1)	☑
slcEventSysadminPassword (1.3.6.1.4.1.244.1.1.0.2)	☑
slcEventSLCShutdown (1.3.6.1.4.1.244.1.1.0.3)	☑
slcEventDevicePortData (1.3.6.1.4.1.244.1.1.0.4)	☑
slcEventDevicePortSLMData (1.3.6.1.4.1.244.1.1.0.5)	☑
slcEventDevicePortSLMConfig (1.3.6.1.4.1.244.1.1.0.6)	☑
slcEventDevicePortDeviceLowTemp (1.3.6.1.4.1.244.1.1.0.7)	☑
slcEventDevicePortDeviceHighTemp (1.3.6.1.4.1.244.1.1.0.8)	☑
slcEventDevicePortDeviceLowHumidity (1.3.6.1.4.1.244.1.1.0.9)	☑
slcEventDevicePortDeviceHighHumidity (1.3.6.1.4.1.244.1.1.0.10)	☑
slcEventDevicePortDeviceError (1.3.6.1.4.1.244.1.1.0.11)	☑
slcEventUSBAction (1.3.6.1.4.1.244.1.1.0.14)	☑
slcEventInternalTemp (1.3.6.1.4.1.244.1.1.0.13)	☑
slcEventDevicePortError (1.3.6.1.4.1.244.1.1.0.15)	□

SNMP Traps Sent/Fail: 267/8, Recv/Trans packets: 215/215 | IP: 14978/6401

V3 Read-Only User

User Name: slc8163248

Password: ●●●●●●●●●●

Retype Password: ●●●●●●●●●●

Passphrase:

Retype Passphrase:

V3 Read-Write User

User Name: snmprwuser

Password: ●●●●●●●●●●

Retype Password: ●●●●●●●●●●

Passphrase:

Retype Passphrase:

2. Enter the following:

Enable Agent	Enables or disables SNMP agent, which allows read-only access to the system. Disabled by default.

Enable Traps	Traps are notifications of certain critical events. Disabled by default. This feature is applicable when SNMP is enabled. Examples of traps that the SLC console manager sends include: ◆ Ethernet Port Link Up ◆ Ethernet Port Link Down ◆ Authentication Failure ◆ SLC Booted ◆ SLC Shutdown ◆ Device Port Logging ◆ Power Supply Status ◆ Sysadmin user password changed The SLC unit sends the traps to the host identified in the **NMS** field.
NMS #1 (or **#2**)	When SNMP is enabled, an NMS (Network Management System) acts as a central server, requesting and receiving SNMP-type information from any computer using SNMP. The NMS can request information from the SLC console manager and receive traps from the SLC unit. Enter the IP address of the NMS server. Required if you selected Enable Traps.
Location	Physical location of the SLC unit (optional). Useful for managing the SLC unit using SNMP. Up to 20 characters.
Contact	Description of the person responsible for maintaining the SLC console manager, for example, a name (optional). Up to 20 characters.

Communities

Read-Only	A string that acs agent provides. The default is **public**.
Read-Write	A string that acts like a password for an SNMP manager to access the read-only data the SLC SNMP agent provides and to modify data where permitted. The default is **private**.
Trap	The trap used for outgoing generic and enterprise traps. Traps sent with the Event trigger mechanism still use the trap community specified with the Event action. The default is **public**.
Enable v1/v2	If checked, SNMP version 1 and version 2 (which use the Read-Only and Read-Write Communities) is enabled. Uncheck to only allow the more secure version 3 to be used to access the SLC unit via SNMP. The default is enabled.
Alarm Delay	Number of seconds delay between outgoing SNMP traps.

Version 3

Security	Levels of security available with SNMP v. 3. ◆ **No Auth/No Encrypt:** No authentication or encryption. ◆ **Auth/No Encrypt:** Authentication but no encryption. (default) ◆ **Auth/Encrypt:** Authentication and encryption.
Auth with	For **Auth/No Encryp** or **Auth/Encrypt**, the authentication method: ◆ **MD5:** Message-Digest algorithm 5 (default) ◆ **SHA:** Secure Hash Algorithm
Encrypt with	Encryption standard to use: ◆ **DES:** Data Encryption Standard (default) ◆ **AES:** Advanced Encryption Standard

V3 Read-Only User

User Name	SNMP v3 is secure and requires user-based authorization to access SLC MIB objects. Enter a user ID. The default is **snmpuser**. Up to 20 characters.
Password/Retype Password	Password for a user with read-only authority to use to access SNMP v3. The default is **SNMPPASS**. Up to 20 characters.
Passphrase/ Retype Passphrase	Passphrase associated with the password for a user with read-only authority. Up to 20 characters.

V3 Read-Write User

User Name	SNMP v3 is secure and requires user-based authorization to access SLC MIB objects. Enter a user ID for users with read-write authority. The default is **snmprwuser**. Up to 20 characters.
Password/ Retype Password	Password for the user with read-write authority to use to access SNMP v3. The default is **SNMPRWPASS**. Up to 20 characters.
Passphrase/ Retype Passphrase	Passphrase associated with the password for a user with read-write authority. Up to 20 characters.

3. To save, click the **Apply** button.

SNMP, SSH, Telnet, and Logging Commands

The following CLI commands correspond to the web page entries described above.

To configure services (system logging, SSH and Telnet access, SSH and Telnet timeout, SNMP agent, email (SMTP) server, and audit log):

```
set services <one or more services parameters>
```

Parameters:

```
alarmdelay <1-6000 Seconds>
auditlog <enable|disable>
auditsize <Size in Kbytes>
```

Range is 1-500 Kbytes.

```
authlog <off|error|warning|info|debug>
clicommands <enable|disable>
contact <Admin contact info>
devlog <off|error|warning|info|debug>
diaglog <off|error|warning|info|debug>
genlog <off|error|warning|info|debug>
includesyslog <enable|disable>
location <Physical Location>
netlog <off|error|warning|info|debug>
nms1 <IP Address or Name>
nms2 <IP Address or Name>
phonehome <enable|disable>
phoneip <IP Address>
portssh <TCP Port>
rocommunity <Read-Only Community Name>
rwcommunity <Read-Write Community Name>
```

```
servlog <off|error|warning|info|debug>
smtpserver <IP Address or Hostname>
snmp <enable|disable>
ssh <enable|disable>
syslogserver1 <IP Address or Name>
syslogserver2 <IP Address or Name>
telnet <enable|disable>
timeoutssh <disable or 1-30>
timeouttelnet <disable or 1-30>
traps <enable|disable>
trapcommunity <Trap Community>
v1ssh <enable|disable>
v1v2 <enable|disable>
v3user <V3 RO User>
v3password <V3 RO User Password>
v3phrase <V3 RO User Passphrase>
v3rwuser <V3 RW User>
v3rwpassword <V3 RW User Password>
v3rwphrase <V3 RW User Passphrase>
v3security <noauth|auth|authencrypt>
v3auth <md5|sha>
v3encrypt <des|aes>
v3password <Password for v3 auth>
v3user <User for v3 auth>
webssh <enable|disable>
webtelnet <enable|disable>
```

To view current services:

```
show services
```

NFS and SMB/CIFS

Use the *Services > NFS/CIFS* page if you want to save configuration and logging data onto a remote NFS server, or export configuration by means of an exported CIFS share.

Mounting an NFS shared directory on a remote network server onto a local SLC directory enables the SLC console manager to store device port logging data on that network server. This configuration avoids possible limitations in the amount of disk space on the SLC unit available for the logging file(s). You may also save SLC configurations on the network server.

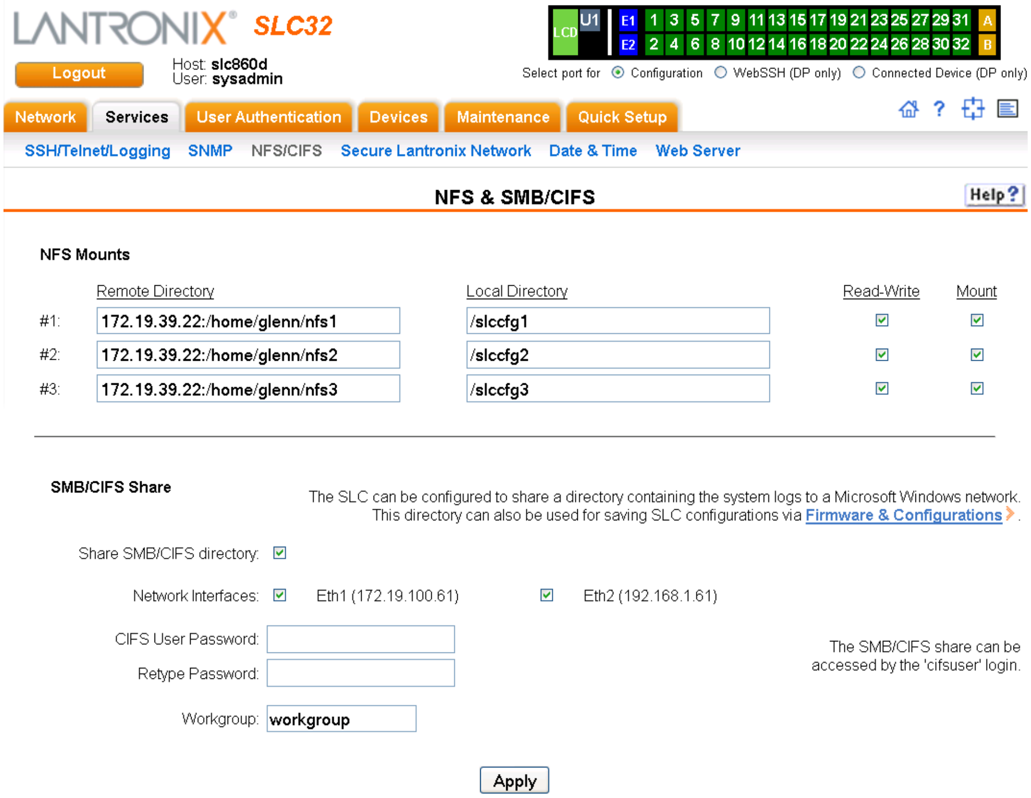
Similarly, use SMB/CIFS (Server Message Block/Common Internet File System), Microsoft's file-sharing protocol, to export a directory on the SLC device as an SMB/CIFS share. The SLC unit exports a single read-write CIFS share called "public," with the subdirectory The `config` directory, which contains saved configurations and is read-write.

The share allows users to access the contents of the directory or map the directory onto a Windows computer.

To configure NFS and SMB/CIFS:

1. Click the **Services** tab and select the **NFS/CIFS** option. The following page displays:

Figure 7-3 Services > NFS/CIFS



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

NFS & SMB/CIFS

NFS Mounts

	Remote Directory	Local Directory	Read-Write	Mount
#1:	172.19.39.22:/home/glenn/nfs1	/slccfg1	☑	☑
#2:	172.19.39.22:/home/glenn/nfs2	/slccfg2	☑	☑
#3:	172.19.39.22:/home/glenn/nfs3	/slccfg3	☑	☑

SMB/CIFS Share

The SLC can be configured to share a directory containing the system logs to a Microsoft Windows network. This directory can also be used for saving SLC configurations via Firmware & Configurations.

Share SMB/CIFS directory: ☑

Network Interfaces: ☑ Eth1 (172.19.100.61) ☑ Eth2 (192.168.1.61)

CIFS User Password:

Retype Password:

The SMB/CIFS share can be accessed by the 'cifsuser' login.

Workgroup: workgroup

2. Enter the following for up to three directories:

NFS Mounts

Remote Directory	The remote NFS share directory in the format: **nfs_server_hostname** or **ipaddr:/exported/path**
Local Directory	The local directory on the SLC console manager on which to mount the remote directory. The SLC unit creates the local directory automatically.
Read-Write	If enabled, indicates that the SLC device can write files to the remote directory. If you plan to log port data or save configurations to this directory, you must enable this option.
Mount	Select the checkbox to enable the SLC unit to mount the file to the NFS server. Disabled by default.

3. Enter the following:

SMB/CIFS Share

Share SMB/CIFS directory	Select the checkbox to enable the SLC console manager to export an SMB/CIFS share called “public.” Disabled by default.
Network Interfaces	Select the network ports from which the share can be seen. The default is for the share to be visible on both network ports.

CIFS User Password/Retype Password	Only one user special username (cifsuser) can access the CIFS share. Enter the CIFS user password in both password fields. The default user password is **CIFSPASS**. More than one user can access the share with the **cifsuser** user name and password at the same time.
Workgroup	The Windows workgroup to which the SLC unit belongs. Every PC exporting a CIFS share must belong to a workgroup. Can have up to 15 characters.

4. To save, click the **Apply** button.

NFS and SMB/CIFS Commands

The following CLI commands correspond to the web page entries described above.

To mount a remote NFS share:

```
set nfs mount <one or more parameters>
```

Parameters:

```
locdir <Directory>
mount <enable|disable>
remdir <Remote NFS Directory>
rw <enable|disable>
```

Enables read/write access to remote directory.

Note: The remdir and locdir parameters are required, but if you specified them previously, you do not need to provide them again.

To unmount a remote NFS share:

```
set nfs unmount <1|2|3>
```

To view NFS share settings:

```
show nfs
```

To configure the SMB/CIFS share, which contains the system and device port logs:

```
set cifs <one or more parameters>
```

Parameters:

```
eth1 <enable|disable>
eth2 <enable|disable>
state <enable|disable>
workgroup <Windows workgroup>
```

Note: The admin config command saves SLC configurations on the SMB/CIFS share.

To change the password for the SMB/CIFS share login (default is cifsuser):

```
set cifs password
```

To view SMB/CIFS settings:

```
show cifs
```

Secure Lantronix Network

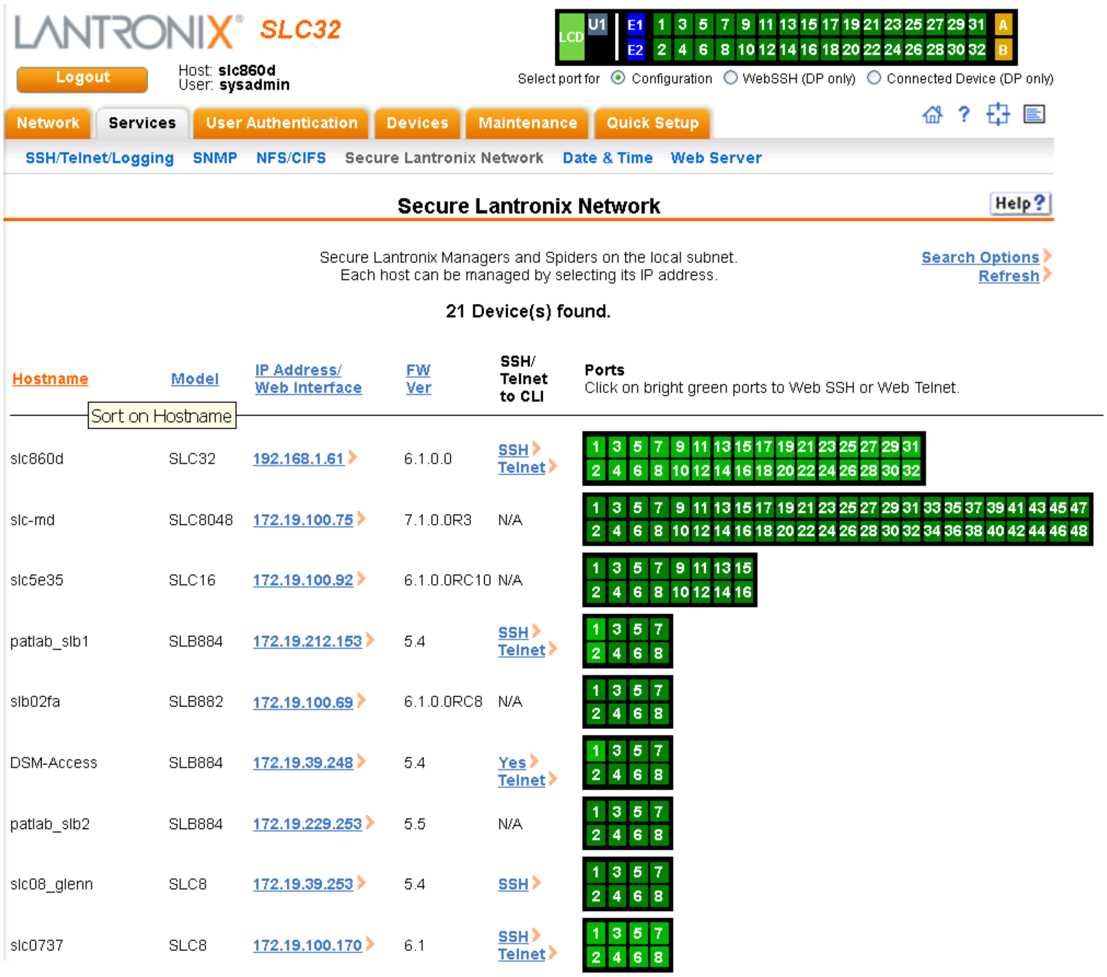
Use the **Secure Lantronix Network** option to view and manage Secure Lantronix Managers and Spider devices on the local subnet.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, reload the web page.*

To access Secure Lantronix Managers and Spider devices on the local network:

1. Click the **Services** tab and select the **Secure Lantronix Network** option. The following page displays.

Figure 7-4 Services > Secure Lantronix Network



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Secure Lantronix Network

Secure Lantronix Managers and Spiders on the local subnet.
Each host can be managed by selecting its IP address.

21 Device(s) found.

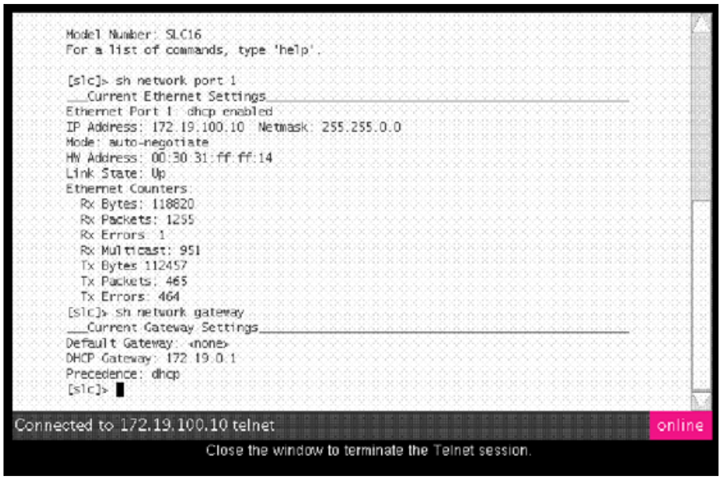
Hostname	Model	IP Address/ Web Interface	FW Ver	SSH/ Telnet to CLI	Ports Click on bright green ports to Web SSH or Web Telnet.
slc860d	SLC32	192.168.1.61	6.1.0.0	SSH Telnet	1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
slc-md	SLC8048	172.19.100.75	7.1.0.0R3	N/A	1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
slc5e35	SLC16	172.19.100.92	6.1.0.0RC10	N/A	1 3 5 7 9 11 13 15 2 4 6 8 10 12 14 16
patlab_slb1	SLB884	172.19.212.153	5.4	SSH Telnet	1 3 5 7 2 4 6 8
slb02fa	SLB882	172.19.100.69	6.1.0.0RC8	N/A	1 3 5 7 2 4 6 8
DSM-Access	SLB884	172.19.39.248	5.4	Yes Telnet	1 3 5 7 2 4 6 8
patlab_slb2	SLB884	172.19.229.253	5.5	N/A	1 3 5 7 2 4 6 8
slc08_glenn	SLC8	172.19.39.253	5.4	SSH	1 3 5 7 2 4 6 8
slc0737	SLC8	172.19.100.170	6.1	SSH Telnet	1 3 5 7 2 4 6 8

2. Click a device **IP Address** in the column labeled **IP Address/Web Interface**. A separate browser opens at the device **Home** page after you have logged in. In the separate browser page, you can manage the device.
3. To access a device port via SSH or Telnet, click on the bright green device ports in the Ports column. SSH/Telnet access to the CLI or a device port requires that Web SSH or Web Telnet is enabled. *Figure 7-5* shows the Telnet window that displays.

To directly access the CLI interface for a device:

1. Click the **SSH** or **Telnet** link in the SSH/Telnet to CLI column directly beside the port you would like to access. A ssh or telnet popup window appears depending on what is clicked.

Figure 7-5 Telnet Session



```
Model Number: SLC16
For a list of commands, type 'help'.

[slc]> sh network port 1
___Current Ethernet Settings________________________________________________
Ethernet Port 1: dhcp enabled
IP Address: 172.19.100.10  Netmask: 255.255.0.0
Mode: auto-negotiate
HW Address: 00:30:31:ff:ff:14
Link State: Up
Ethernet Counters:
  Rx Bytes: 118820
  Rx Packets: 1255
  Rx Errors: 1
  Rx Multicast: 951
  Tx Bytes 112457
  Tx Packets: 465
  Tx Errors: 464
[slc]> sh network gateway
___Current Gateway Settings_________________________________________________
Default Gateway: <none>
DHCP Gateway: 172.19.0.1
Precedence: dhcp
[slc]> █
```

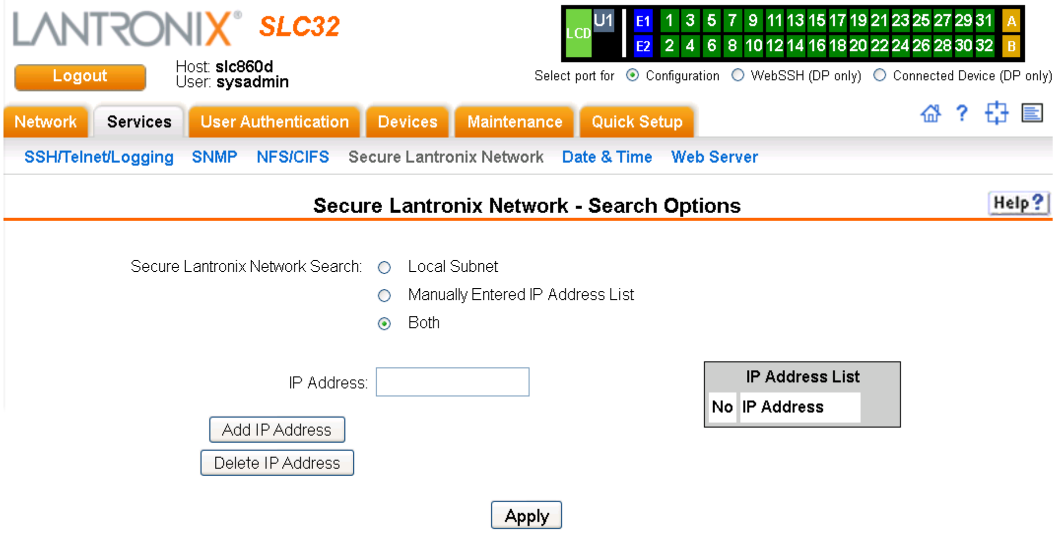
Connected to 172.19.100.10 telnet

Close the window to terminate the Telnet session.

To configure how Secure Lantronix devices are searched for on the network:

1. Click the **Search Options** link on the top right of the *Services > Secure Lantronix Network* page. The following web page displays:

Figure 7-6 Services > Secure Lantronix Network > Search Options


LANTRONIX SLC32
Logout
Host: slc860d
User: sysadmin
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
SSH/Telnet/Logging SNMP NFS/CIFS Secure Lantronix Network Date & Time Web Server
Help?
Add IP Address
Delete IP Address
Apply

Secure Lantronix Network - Search Options

Secure Lantronix Network Search: ○ Local Subnet ○ Manually Entered IP Address List ● Both

IP Address:

IP Address List	
No	IP Address

2. Enter the following:

Secure Lantronix Network Search	Select the type of search you want to conduct. ◆ **Local Subnet** performs a broadcast to detect Secure Lantronix devices on the local subnet. ◆ **Manually Entered IP Address List** provides a list of IP addresses that may not respond to a broadcast because of how the network is configured. ◆ **Both** is the default selection.
IP Address	If you selected Manually Entered IP Address List or Both, enter the IP address of the Secure Lantronix device you want to find and manage.

3. If you entered an IP address, click the **Add IP Address** button. The IP address displays in the IP Address List.
4. Repeat steps 2 and 3 for each IP address you want to add.
5. To delete an IP address from the IP Address List, select the address and click the **Delete IP Address** button.
6. Click the **Apply** button. When the confirmation message displays, click **Secure Lantronix Network** on the main menu. The *Services > Secure Lantronix Network* page displays the Secure Lantronix devices resulting from the search. You can now manage these devices.

Secure Lantronix Network Commands

The following commands for the command line interface correspond to the web page entries described above.

To detect and view all SLC console manager or user-defined IP addresses on the local network:

```
set slcnetwork <one or more parameters>
```

Parameters:

```
add <IP Address>
delete <IP Address>
search <localsubnet|ipaddrlist|both>
```

To detect and display all secure Lantronix managers and Spider devices on the local network:

```
show slcnetwork [ipaddrlist <all|Address Mask>]
```

Note: *Without the ipaddrlist parameter, the command searches the network according to the search setting. With the ipaddrlist parameter, the command displays a sorted list of all IP addresses or displays the IP addresses that match the mask (for example, 172.19.255.255 would display all IP addresses that start with 172.19).*

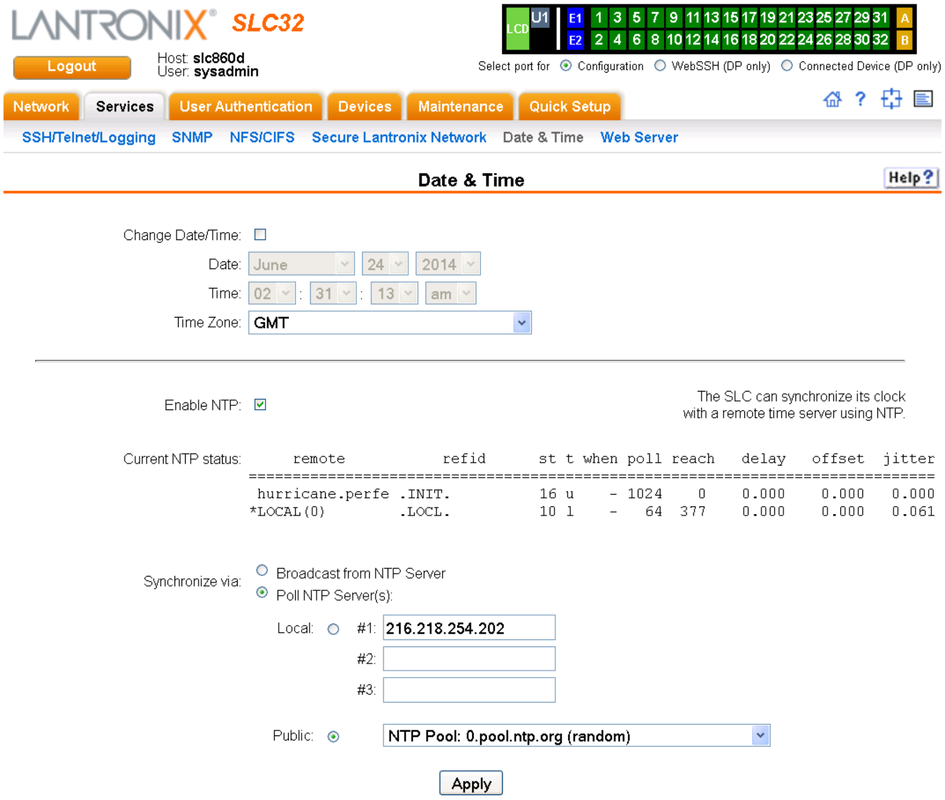
Date and Time

You can specify the current date, time, and time zone at the SLC console manager's location (default), or the SLC unit can use NTP to synchronize with other NTP devices on your network.

To set the local date, time, and time zone:

1. Click the **Services** tab and select the **Date & Time** option. The following page displays:

Figure 7-7 Services > Date & Time



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Date & Time

Change Date/Time: □

Date: June 24 2014

Time: 02 : 31 : 13 am

Time Zone: GMT

Enable NTP: ☑

The SLC can synchronize its clock with a remote time server using NTP.

Current NTP status:

```
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 hurricane.perfe .INIT.          16 u    - 1024    0    0.000    0.000   0.000
*LOCAL(0)        .LOCL.          10 l    -   64  377    0.000    0.000   0.061
```

Synchronize via: ○ Broadcast from NTP Server
● Poll NTP Server(s):

Local: ○ #1: 216.218.254.202
#2:
#3:

Public: ● NTP Pool: 0.pool.ntp.org (random)

2. Enter the following:

Change Date/Time	Select the checkbox to manually enter the date and time at the SLC device 's location.
Date	From the drop-down lists, select the current month, day, and year.

Time	From the drop-down lists, select the current hour and minute.
Time Zone	From the drop-down list, select the appropriate time zone.

3. To save, click the **Apply** button.

To synchronize the SLC unit with a remote timeserver using NTP:

1. Enter the following:

Enable NTP	Select the checkbox to enable NTP synchronization. NTP is disabled by default.
Synchronize via	Select one of the following: ◆ **Broadcast from NTP Server:** Enables the SLC console manager to accept time information periodically transmitted by the NTP server. This is the default if you enable NTP. ◆ **Poll NTP Server:** Enables the SLC unit to query the NTP Server for the correct time. If you select this option, complete one of the following: ➢ ***Local:*** Select this option if the NTP servers are on a local network, and enter the IP address of up to three NTP servers. This is the default, and it is highly recommended. ➢ ***Public:*** Select this option if you want to use a public NTP server, and select the address of the NTP server from the drop-down list. This is not recommended because of the high load on many public NTP servers. All servers in the drop-down list are stratum-2 servers. (See www.ntp.org for more information.) Each public NTP server has its own usage rules --please refer to the appropriate web site before using one. Our listing them here is to provide easy configuration but does not indicate any permission for use.

2. To save, click the **Apply** button.

Date and Time Commands

The following CLI commands correspond to the web page entries described above.

To set the local date, time, and local time zone (one parameter at a time):

```
set datetime <one date/time parameter>
```

Parameters:

```
date <MMDDYYhhmm[ss]>
timezone <Time Zone>
```

Note: *If you type an invalid time zone, the system guides you through the process of selecting a time zone.*

To view the local date, time, and time zone:

```
show datetime
```

To synchronize the SLC console manager with a remote time server using NTP:

```
set ntp <one or more ntp parameters>
```

Parameters:

```
localserver1 <IP Address or Hostname>
localserver2 <IP Address or Hostname>
```

```
localserver3 <IP Address or Hostname>
poll <local|public>
publicserver <IP Address or Hostname>
state <enable|disable>
sync <broadcast|poll>
```

To view NTP settings:

```
show ntp
```

Web Server

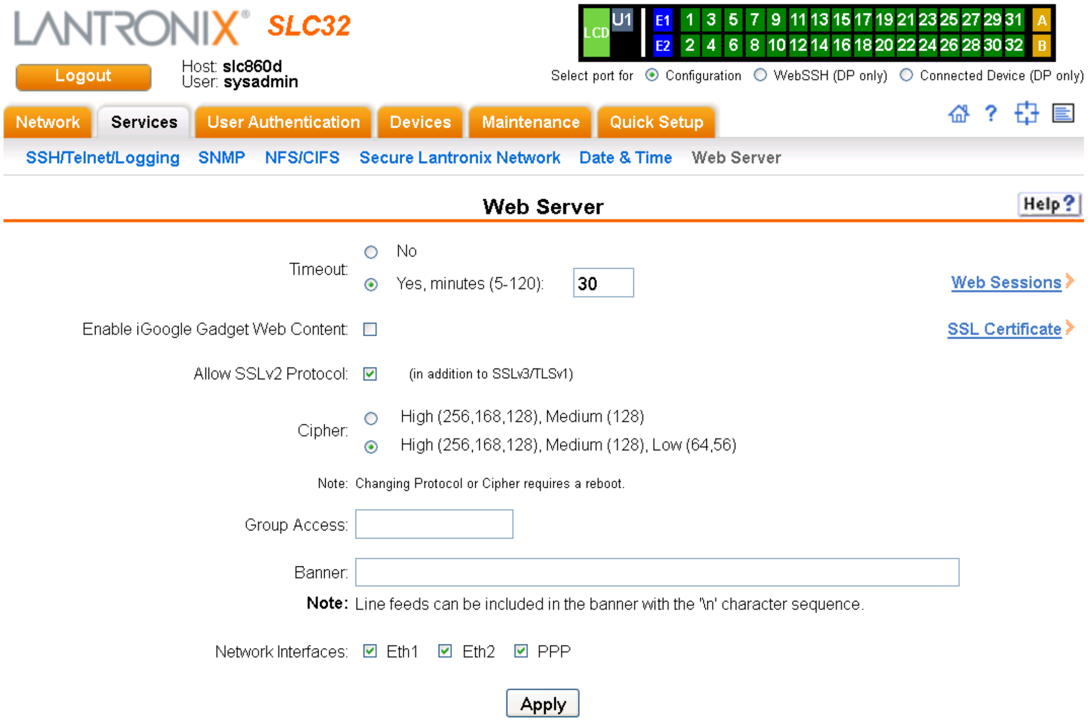
The Web Server page allows the system administrator to:

- Configure attributes of the web server.
- View and terminate current web sessions.
- Import a site-specific SSL certificate.
- Enable an iGoogle gadget that displays the status of ports on multiple SLC units.

To configure the Web Server:

1. Click the **Services** tab and select the **Web Server** option. The following page appears:

Figure 7-8 Services > Web Server



Web Server

Timeout: ○ No ● Yes, minutes (5-120): 30

Enable iGoogle Gadget Web Content: □

Allow SSLv2 Protocol: ☑ (in addition to SSLv3/TLSv1)

Cipher: ○ High (256,168,128), Medium (128) ● High (256,168,128), Medium (128), Low (64,56)

Note: Changing Protocol or Cipher requires a reboot.

Group Access:

Banner:

Note: Line feeds can be included in the banner with the '\n' character sequence.

Network Interfaces: ☑ Eth1 ☑ Eth2 ☑ PPP

Apply

2. Enter the following fields:

Timeout	◆ Select **No** to disable Timeout. ◆ Select **Yes, minutes (5-120)** to enable timeout. Enter the number of minutes (must be between 30 and 120 minutes) after which the SLC web session times out. The default is 5. ***Note:*** *If a session times out, refresh the browser page and login to a new web session.*
Enable iGoogle Gadget Web Content	Select the check box to enable an SLC iGoogle gadget. The iGoogle gadget allows an iGoogle user to view the port status of many SLC units on one web page. (*See iGoogle Gadgets on page 88.*)
Allow SSLv2 Protocol	Click the checkbox to support SSLv2 protocol. By default, the web supports the SSLv3/TLSv1 protocol. Changing this option requires a reboot for the change to take effect.
Cipher	Click one of the radio buttons to configure the web to support low security (less than 128 bits) or High/Medium security (128 bits or higher) for the cipher. By default, the web uses High/Medium. Changing this option requires a reboot for the change to take effect.
Group Access	If undefined, any group can access the web. If one or more groups are specified (groups are delimited by the characters ',' (comma) or ';' (semicolon)), then any user who logs into the web must be a member of one of the specified groups, otherwise access will be denied. Users authenticated via RADIUS may have a group (or groups) provided by the RADIUS server via the Filter-Id attribute that overrides the group defined for a user on the SLC or SLB unit. A group provided by a remote server must be either a single group or multiple groups delimited by the characters ',' (comma), ';' (semicolon), or '=' (equals) - for example "group=group1,group2;" or "group1,group2,group3".
Banner	The text to display on the web manager home page after the user logs in. May contain up to 1024 characters (single quote and double quote characters are not supported). Blank by default. ***Note:*** *To create additional lines in the banner use the \n character sequence.*
Network Interfaces	The interfaces that the web server is available on. By default, Eth1, Eth2 and PPP interfaces on modems are enabled.
Web Sessions	Click the Web Sessions link to view or terminate a web session. (*See Services - Web Sessions on page 85.*)
SSL Certificate	Click the SSL Certificate link to view, import or reset the SSL Certificate. ()

3. Click the **Apply** button to save.

Admin Web Commands

The following CLI commands correspond to the wegb page entries described above.

To configure the timeout for web sessions:

```
admin web timeout <disable|5-120 minutes>
```

To configure the web server to use SSLv2 in addition to SSLv3 and TLSv1:

```
admin web protocol <sslv2|nosslv2>
```

To configure the strength of the cipher used by the web server

```
(high is 256 or 128 bit, medium is 128 bit, low is 64, 56 or 40 bit):
admin web cipher <himed|himedlow>
```

To enable or disable iGoogle Gadget web content:

```
admin web gadget <enable|disable>
```

To configure the group that can access the web:

```
admin web group <Local or Remote Group Name>
```

To configures the banner displayed on the web home page:

```
admin web banner <Banner Text>
```

To define a list of network interfaces the web is available on:

```
admin web iface <none,eth1,eth2,ppp>
```

To terminate a web session:

```
admin web terminate <Session ID>
```

To view the current sessions and their ID:

```
admin web show
```

To import an SSL certificate or reset the web server certificate to the default:

```
admin web certificate import via <sftp|scp> certfile <Certificate File>
          privfile <Private Key File> host <IP Address or Name>
          login <User Login> [path <Path to Files>]
admin web certificate reset
admin web certificate show

admin web show [viewslmsessions <enable|disable>]
```

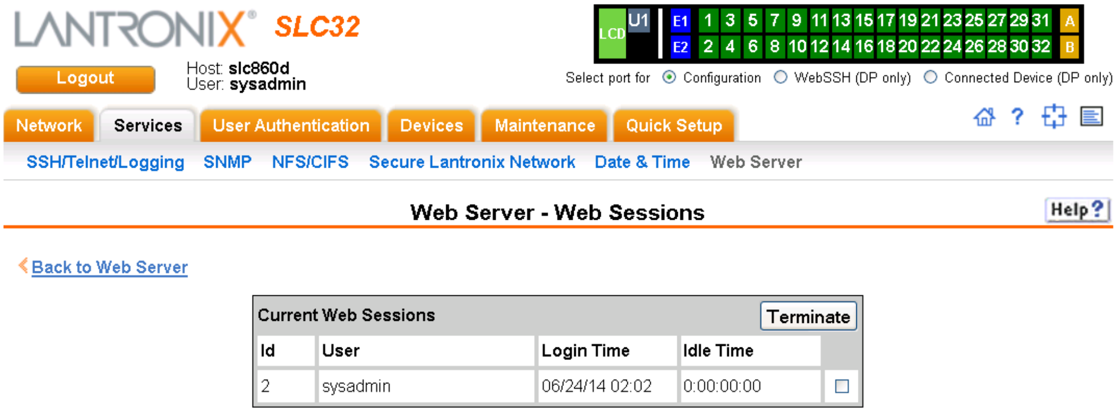
Services - Web Sessions

The *Services > Web Server* page enables you to view and terminate current web sessions.

To view or terminate current web sessions:

1. On the **Services** tab, click the **Web Server** page and click the **Web Sessions** link to the right. The following page displays:

Figure 7-9 Web Sessions


LANTRONIX SLC32
Logout
Host: slc860d
User: sysadmin
LCD U1 E1 E2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
SSH/Telnet/Logging SNMP NFS/CIFS Secure Lantronix Network Date & Time Web Server
Web Server - Web Sessions
Help ?
Back to Web Server
Terminate

Current Web Sessions

Id	User	Login Time	Idle Time	
2	sysadmin	06/24/14 02:02	0:00:00:00	□

2. To terminate, click the check box in the row of the session you want to terminate.
3. To return to the *Services > Web Server* page, click the **Back to Web Server** link.

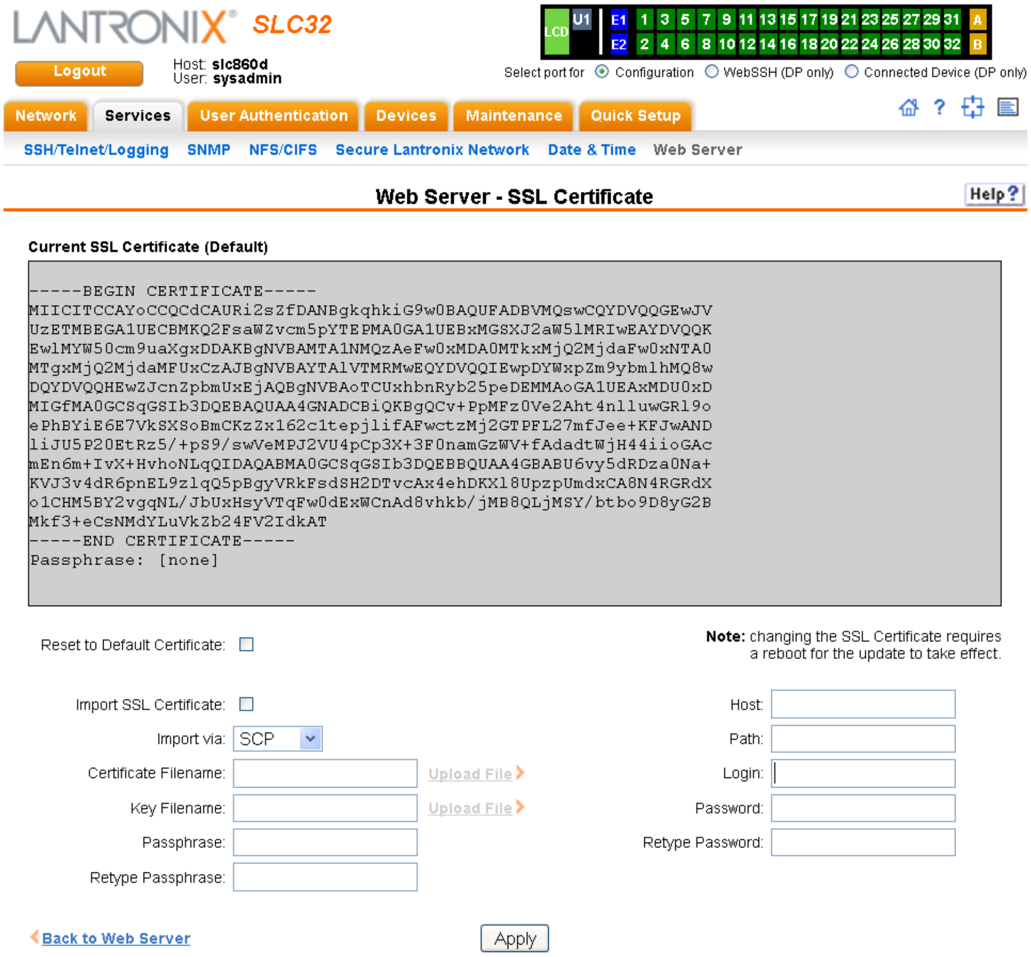
Services - SSL Certificate

The *Services > Web Server* page enables you to view and update SSL certificate information. The SSL certificate, consisting of a public/private key pair used to encrypt HTTP data, is associated with the web server. You can import a site-specific SSL certificate, if desired.

To view, reset, import, or change an SSL Certificate:

1. On the **Services** tab, click the **Web Server** page and click the **SSL Certificate** link. The following page displays the current SSL certificate.

Figure 7-10 SSL Certificate



Web Server - SSL Certificate

Current SSL Certificate (Default)

```
-----BEGIN CERTIFICATE-----
MIICITCCAYoCCQCdCAURi2sZfDANBgkqhkiG9w0BAQUFADBVMQswCQYDVQQGEwJV
UzETMBEGA1UECBMKQ2FsaWZvcm5pYTEPMA0GA1UEBxMGSXJ2aW5lMRIwEAYDVQQK
EwlMYW50cm9uaXgxDDAKBgNVBAMTA1NMQzAeFw0xMDA0MTkxMjQ2MjdaFw0xNTA0
MTgxMjQ2MjdaMFUxCzAJBgNVBAYTAlVTMRMwEQYDVQQIEwpDYWxpZm9ybmlhMQ8w
DQYDVQQHEwZJcnZpbmUxEjAQBgNVBAoTCUxhbnRyb25peDEMMAoGA1UEAxMDU0xD
MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCv+PpMFz0Ve2Aht4nlluwGRl9o
ePhBYiE6E7VkSXSoBmCKzZx162c1tepjlifAFwctzMj2GTPFL27mfJee+KFJwAND
liJU5P20EtRz5/+pS9/swVeMPJ2VU4pCp3X+3F0namGzWV+fAdadtWjH44iioGAc
mEn6m+IvX+HvhoNLqQIDAQABMA0GCSqGSIb3DQEBBQUAA4GBABU6vy5dRDza0Na+
KVJ3v4dR6pnEL9zlqQ5pBgyVRkFsdSH2DTvcAx4ehDKXl8UpzpUmdxCA8N4RGRdX
o1CHM5BY2vgqNL/JbUxHsyVTqFw0dExWCnAd8vhkb/jMB8QLjMSY/btbo9D8yG2B
Mkf3+eCsNMdYLuVkZb24FV2IdkAT
-----END CERTIFICATE-----
Passphrase: [none]
```

Reset to Default Certificate: □

Note: changing the SSL Certificate requires a reboot for the update to take effect.

Import SSL Certificate: □

Import via: SCP

Certificate Filename: Upload File

Key Filename: Upload File

Passphrase:

Retype Passphrase:

Host:

Path:

Login:

Password:

Retype Password:

Back to Web Server

Apply

2. If desired, enter the following:

Reset to Default Certificate	To reset to the default certificate, select the checkbox to reset to the default certificate. Unselected by default.
Import SSL Certificate	To import your own SSL Certificate, select the checkbox. Unselected by default.
Import via	From the drop-down list, select the method of importing the certificate (SCP or SFTP). The default is **SCP**.
Certificate Filename	Filename of the certificate.
Key Filename	Filename of the private key for the certificate.
Passphrase / Retype Passphrase	Enter the passphrase associated with the SSL certificate if the private key is encrypted protected with a passphrase.
Host	Host name or IPaddress of the host from which to import the file.
Path	Path of the directory where the certificate will be stored.
Login	User ID to use to SCP or SFTP the file.
Password / Retype Password	Password to use to SCP or SFTP the file.

3. Click the **Apply** button.

Note: *You must reboot the SLC console manager for the update to take effect.*

4. To return to the *Services > Web Server* page, click the **Back to Web Server** link.

Web Server Commands

The following CLI commands correspond to the **Web Server** page. For more information, see *Chapter 15: Command Reference*.

- `admin web certificate`
- `admin web certificate reset`
- `admin web cipher`
- `admin web gadget`
- `admin web protocol`
- `admin web timeout`
- `admin web terminate`
- `admin web show`

iGoogle Gadgets

You can create an iGoogle gadgets that enables you to view the status of the ports of many SLCs on one web page.

Anyone with a Google email account (gmail.com) can create an iGoogle gadget for viewing web pages. There are two types of iGoogle gadgets: public gadgets and private gadgets. The public gadgets are listed for import on iGoogle web pages. The SLC gadget is a private gadget, whose location is not publicly advertised.

To set up an SLC iGoogle gadget:

1. Load the following XML code on a web server that is accessible over the Internet. This code describes how to retrieve information and how to format the data for display.

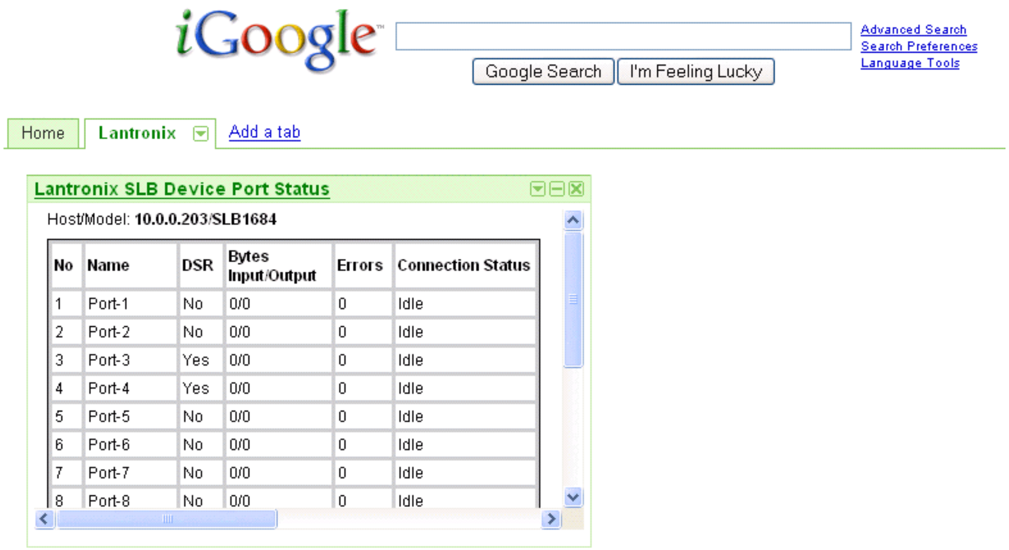
```
   <?xml version="1.0" encoding="UTF-8" ?>
-  <Module>
   <ModulePrefs title="__UP_model__ Devport Status"
         title_url="http://www.lantronix.com"
         directory_title="SLC Status" description="Devport
         status and counters" scrolling="true" width="400"
         height="360" />
   <UserPref name="model" display_name="Model" datatype="enum"
         default_value="SLC">
   <EnumValue value="SLC" display_value="SLC" />
   <EnumValue value="SLC" display_value="SLC" />
         </UserPref>
   <UserPref name="ip" display_name="IP Address" required="true" />
-  <UserPref name="rate" display_name="Refresh Rate"
         datatype="enum" default_value="10">
   <EnumValue value="1" display_value="1 second" />
   <EnumValue value="5" display_value="5 seconds" />
```

```
<EnumValue value="10" display_value="10 seconds" />
<EnumValue value="30" display_value="30 seconds" />
<EnumValue value="60" display_value="1 minute" />
<EnumValue value="300" display_value="5 minutes" />
<EnumValue value="600" display_value="10 minutes" />
      /UserPref>
<Content type="url" href="http://__UP_ip__/devstatus.htm" />
      </Module>
```

2. On the iGoogle web page, click the **Add stuff** link.
3. On the new page, click the **Add feed or gadget** link.
4. In the field that displays, type the URL of the gadget location.
5. Return to the gadget viewing page and complete the SLC gadget configuration fields.

You should see an iGoogle gadget similar to the following:

Figure 7-11 iGoogle Gadget Example



Host/Model: **10.0.0.203/SLB1684**

No	Name	DSR	Bytes Input/Output	Errors	Connection Status
1	Port-1	No	0/0	0	Idle
2	Port-2	No	0/0	0	Idle
3	Port-3	Yes	0/0	0	Idle
4	Port-4	Yes	0/0	0	Idle
5	Port-5	No	0/0	0	Idle
6	Port-6	No	0/0	0	Idle
7	Port-7	No	0/0	0	Idle
8	Port-8	No	0/0	0	Idle

8: Device Ports

This chapter describes how to configure and use an SLC device port connected to an external device, such as a server or a modem. The next chapter, *Chapter 11: Connections* describes how to use the *Devices > Connections* web page to connect external devices and outbound network connections (such as Telnet or SSH) in various configurations. The *Devices > Console Port* page allows you to configure the console port, if desired.

Connection Methods

A user can connect to a device port in one of the following ways:

1. Telnet or SSH to the Eth1 or Eth2 IP address, or connect to the console port, and log in to the command line interface. At the command line interface, issue the connect direct or connect listen commands.
2. If Telnet is enabled for a device port, Telnet to <Eth1 IP address>:< telnet port number> or <Eth2 IP address>:<telnet port number>, where telnet port number is uniquely assigned for each device port.
3. If SSH is enabled for a device port, SSH to <Eth1 IP address>:<ssh port number> or <Eth2 IP address>:<ssh port number>, where ssh port number is uniquely assigned for each device port.
4. If TCP is enabled for a device port, establish a raw TCP connection to <Eth1 IP address>:<tcp port number> or <Eth2 IP address>:<tcp port number>, where tcp port number is uniquely assigned for each device port.
5. If a device port has an IP address assigned to it, you can Telnet, SSH, or establish a raw TCP connection to the IP address. For Telnet and SSH, use the default TCP port number (23 and 22, respectively) to connect to the device port. For raw TCP, use the TCP port number defined for TCP In to the device port according to the *Device Ports - Settings (on page 94)* section.
6. Connect a terminal or a terminal emulation program directly to the device port. If logins are enabled, the user is prompted for a username and password and logs in to the command line interface.

   For #2, #3, #4, #5, and #6, if logins or authentication are not enabled, the user is directly connected to the device port with no authentication.

   For #1 and #6, if logins are enabled, the user is authenticated first, and then logged into the command line interface. The user login determines permissions for accessing device ports.

Permissions

There are three types of permissions:

1. **Direct (or data) mode:** The user can interact with and monitor the device port (connect direct command).
2. **Listen mode:** The user can only monitor the device port (connect listen command).
3. **Clear mode:** The user can clear the contents of the device port buffer (set locallog <port> clear buffer command).

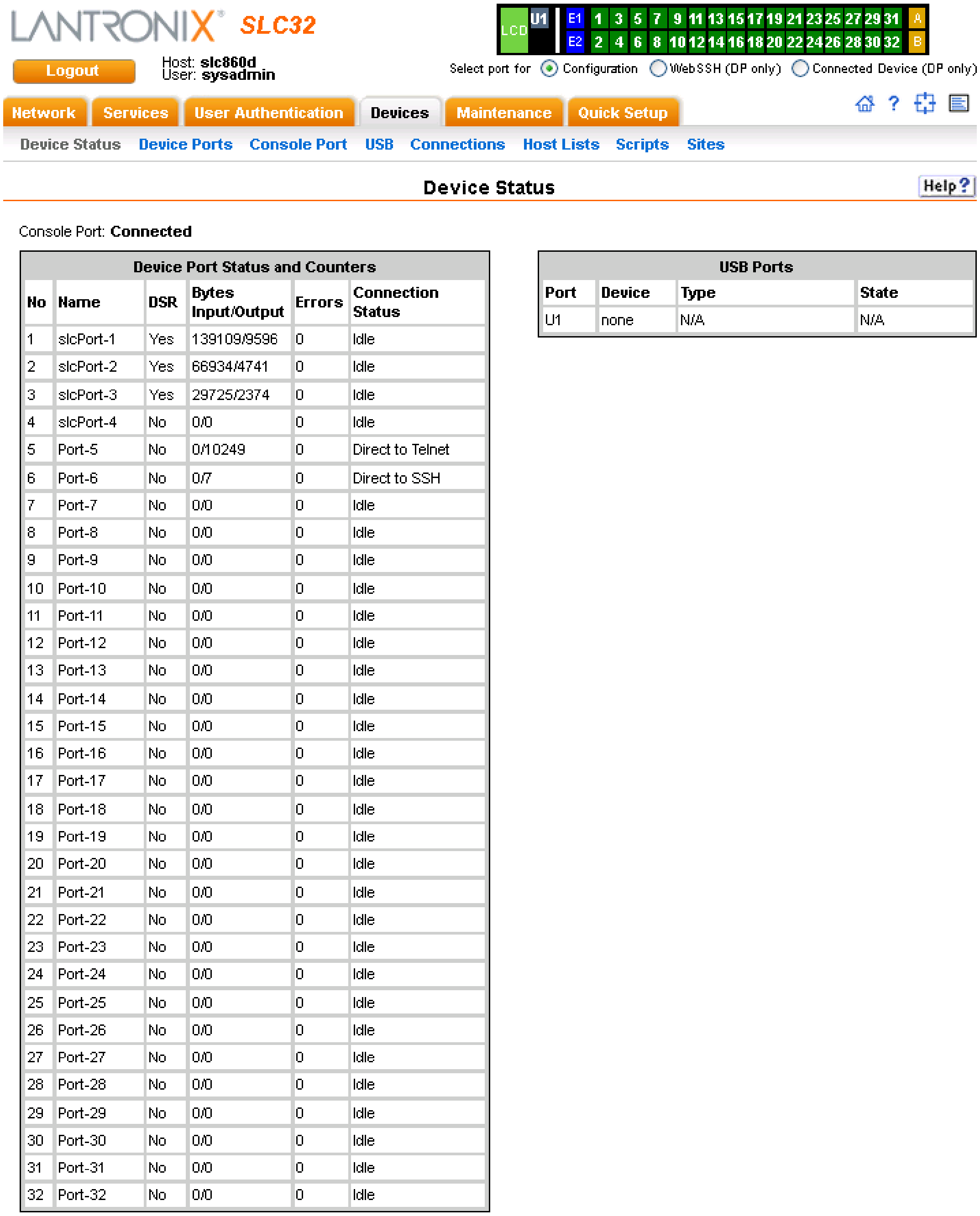
The administrator and users with local user rights may assign individual port permissions to local users. The administrator and users with remote authentication rights assign port access to users authenticated by NIS, RADIUS, LDAP, Kerberos and TACACS+.

Device Status

The *Devices > Device Status* page displays the status of the SLC console manager's ports, and power outlets.

1. Click the **Devices** tab and select the **Device Status** option. The following page displays:

Figure 8-1 Devices > Device Status



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Device Status

Console Port: **Connected**

Device Port Status and Counters					
No	Name	DSR	Bytes Input/Output	Errors	Connection Status
1	slcPort-1	Yes	139109/9596	0	Idle
2	slcPort-2	Yes	66934/4741	0	Idle
3	slcPort-3	Yes	29725/2374	0	Idle
4	slcPort-4	No	0/0	0	Idle
5	Port-5	No	0/10249	0	Direct to Telnet
6	Port-6	No	0/7	0	Direct to SSH
7	Port-7	No	0/0	0	Idle
8	Port-8	No	0/0	0	Idle
9	Port-9	No	0/0	0	Idle
10	Port-10	No	0/0	0	Idle
11	Port-11	No	0/0	0	Idle
12	Port-12	No	0/0	0	Idle
13	Port-13	No	0/0	0	Idle
14	Port-14	No	0/0	0	Idle
15	Port-15	No	0/0	0	Idle
16	Port-16	No	0/0	0	Idle
17	Port-17	No	0/0	0	Idle
18	Port-18	No	0/0	0	Idle
19	Port-19	No	0/0	0	Idle
20	Port-20	No	0/0	0	Idle
21	Port-21	No	0/0	0	Idle
22	Port-22	No	0/0	0	Idle
23	Port-23	No	0/0	0	Idle
24	Port-24	No	0/0	0	Idle
25	Port-25	No	0/0	0	Idle
26	Port-26	No	0/0	0	Idle
27	Port-27	No	0/0	0	Idle
28	Port-28	No	0/0	0	Idle
29	Port-29	No	0/0	0	Idle
30	Port-30	No	0/0	0	Idle
31	Port-31	No	0/0	0	Idle
32	Port-32	No	0/0	0	Idle

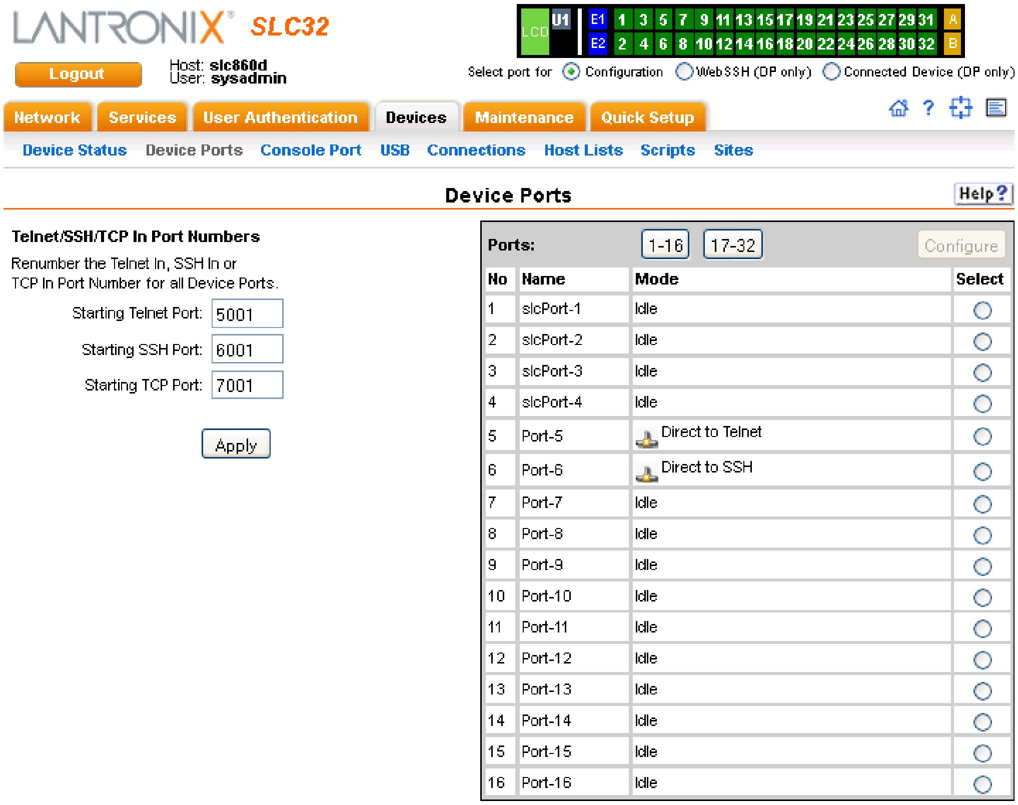
USB Ports			
Port	Device	Type	State
U1	none	N/A	N/A

Device Port Settings

On the *Devices > Device Ports* page, you can set up the numbering of Telnet, SSH, and TCP ports, view a summary of current port modes, establish the maximum number of direct connections for each device port, and select individual ports to configure.

1. Click the **Devices** tab and select the **Device Ports** option. The following page displays:

Figure 8-2 Devices > Device Ports


LANTRONIX SLC32
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Logout
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help ?

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Device Ports

Telnet/SSH/TCP In Port Numbers

Renumber the Telnet In, SSH In or TCP In Port Number for all Device Ports.

Starting Telnet Port: 5001

Starting SSH Port: 6001

Starting TCP Port: 7001

Apply

Ports: 1-16 17-32 Configure

No	Name	Mode	Select
1	slcPort-1	Idle	○
2	slcPort-2	Idle	○
3	slcPort-3	Idle	○
4	slcPort-4	Idle	○
5	Port-5	Direct to Telnet	○
6	Port-6	Direct to SSH	○
7	Port-7	Idle	○
8	Port-8	Idle	○
9	Port-9	Idle	○
10	Port-10	Idle	○
11	Port-11	Idle	○
12	Port-12	Idle	○
13	Port-13	Idle	○
14	Port-14	Idle	○
15	Port-15	Idle	○
16	Port-16	Idle	○

Current port numbering schemes for Telnet, SSH, and TCP ports display on the left. The list of ports 1-16 on the right includes the individual ports and their current mode.

Note: *For units with more ports, click the buttons above the table to view additional ports.*

Icons that represent some of the possible modes include:

Idle	The port is not in use.
	The port is in data/text mode. ***Note:*** *You may set up ports to allow Telnet access using the IP Setting per Device Ports - Settings (on page 94).*
☎	An external modem is connected to the port. The user may dial into or out of the port.
	Telnet in or SSH in is enabled for the device port. The device port is either waiting for a Telnet or SSH login or has received a Telnet or SSH login (a user has logged in).

To set up Telnet, SSH, and TCP port numbering:

1. Enter the following:

Telnet/SSH/TCP in Port Numbers

Starting Telnet Port	Each port is assigned a number for connecting via Telnet. Enter a number (1025-65528) that represents the first port. The default is 2000 plus the port number. For example, if you enter 2001, subsequent ports are automatically assigned numbers 2002, 2003, and so on.
Starting SSH Port	Each port is assigned a number for connecting via SSH. Enter a number (1025-65528) that represents the first port. The default is 3000 plus the port number. For example, if you enter 3001, subsequent ports are automatically assigned numbers 3002, 3003, and so on.
Starting TCP Port	Each port is assigned a number for connecting through a raw TCP connection. Enter a number (1025-65528) that represents the first port. The default is 4000 plus the port number. For example, if you enter 4001, subsequent ports are automatically numbered 4002, 4003, and so on. You can use a raw TCP connection in situations where a TCP/IP connection is to communicate with a serial device. For example, you can connect a serial printer to a device port and use a raw TCP connection to spool print jobs to the printer over the network. *Note: When using raw TCP connections to transmit binary data, or where the break command (escape sequence) is not required, set the Break Sequence of the respective device port to null (clear it).*

Caution: ***Ports 1-1024 are RFC-assigned and may conflict with services running on the SLC unit. Avoid this range.***

2. Click the **Apply** button to save the settings.

To set limits on direct connections:

1. Enter the maximum number (1-10) of simultaneous direct connections for each device port. The default is 1.
2. Click the **Apply** button to save the settings.

To configure a specific port:

1. You have two options:
   - Select the port from the ports list and click the **Configure** button. The *Device Ports > Settings* page for the port displays.
   - Click the port number on the green bar at the top of each page.
2. Continue with directions in the section, *Device Ports - Settings (on page 94)*.

Global Commands

The following CLI commands correspond to the web page entries described above.

To configure settings for all or a group of device ports:

```
set deviceport global <one or more parameters>
```

Parameters:

```
sshport <TCP Port>
tcpport <TCP Port>
telnetport <TCP Port>
```

Port is a port number between 1025 and 65528.

To view global settings for device ports:

```
show deviceport global
```

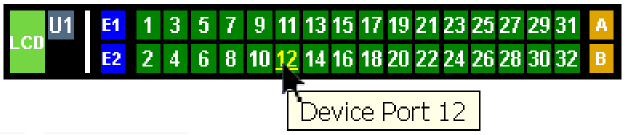
Device Ports - Settings

On the *Device Ports > Settings* page, configure IP and data (serial) settings for individual ports, and if the port connects to an external modem, modem settings as well.

To open the Device Ports - Settings page:

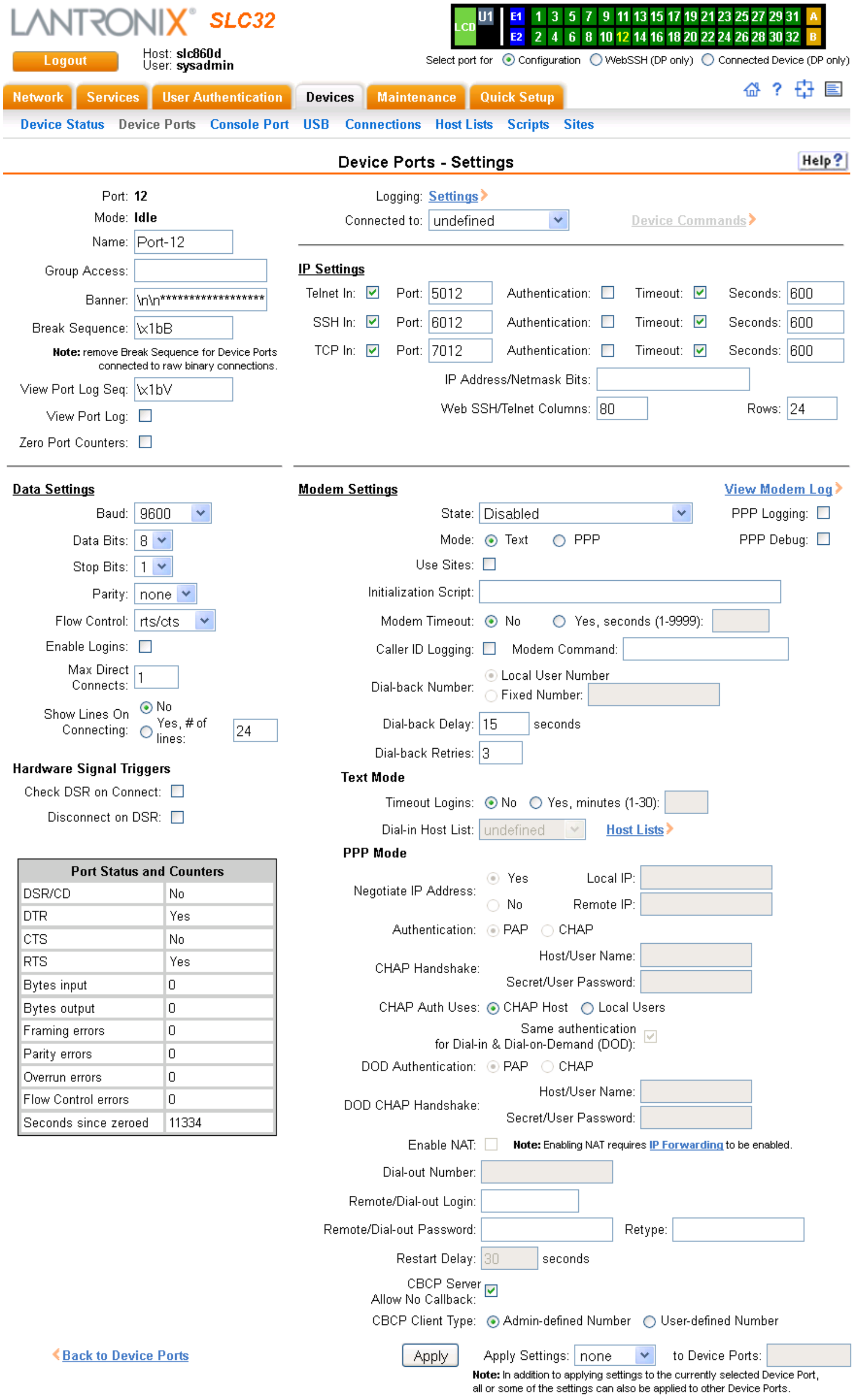
1. You have two options:
   - In the *Device Ports List* page (described in the previous section), select the port from the ports list and click the **Configure** button.
   - Click the desired port number in the green bar (shown below) at the top of any page:

Figure 8-3 Device Ports List



The following page displays:

Figure 8-4 Device Ports > Settings


LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help?

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Device Ports - Settings

Port: 12
Mode: Idle
Name: Port-12
Group Access:
Banner: \n\n******************
Break Sequence: \x1bB

Note: remove Break Sequence for Device Ports connected to raw binary connections.

View Port Log Seq: \x1bV
View Port Log: □
Zero Port Counters: □

Logging: Settings
Connected to: undefined
Device Commands

IP Settings

Telnet In: ☑ Port: 5012 Authentication: □ Timeout: ☑ Seconds: 600
SSH In: ☑ Port: 6012 Authentication: □ Timeout: ☑ Seconds: 600
TCP In: ☑ Port: 7012 Authentication: □ Timeout: ☑ Seconds: 600
IP Address/Netmask Bits:
Web SSH/Telnet Columns: 80 Rows: 24

Data Settings

Baud: 9600
Data Bits: 8
Stop Bits: 1
Parity: none
Flow Control: rts/cts
Enable Logins: □
Max Direct Connects: 1
Show Lines On Connecting: ● No ○ Yes, # of lines: 24

Hardware Signal Triggers

Check DSR on Connect: □
Disconnect on DSR: □

Port Status and Counters	
DSR/CD	No
DTR	Yes
CTS	No
RTS	Yes
Bytes input	0
Bytes output	0
Framing errors	0
Parity errors	0
Overrun errors	0
Flow Control errors	0
Seconds since zeroed	11334

Modem Settings

View Modem Log

State: Disabled
PPP Logging: □
Mode: ● Text ○ PPP
PPP Debug: □
Use Sites: □
Initialization Script:
Modem Timeout: ● No ○ Yes, seconds (1-9999):
Caller ID Logging: □ Modem Command:
Dial-back Number: ● Local User Number ○ Fixed Number:
Dial-back Delay: 15 seconds
Dial-back Retries: 3

Text Mode

Timeout Logins: ● No ○ Yes, minutes (1-30):
Dial-in Host List: undefined Host Lists

PPP Mode

Negotiate IP Address: ● Yes Local IP: ○ No Remote IP:
Authentication: ● PAP ○ CHAP
CHAP Handshake: Host/User Name: Secret/User Password:
CHAP Auth Uses: ● CHAP Host ○ Local Users
Same authentication for Dial-in & Dial-on-Demand (DOD): ☑
DOD Authentication: ● PAP ○ CHAP
DOD CHAP Handshake: Host/User Name: Secret/User Password:
Enable NAT: □ **Note:** Enabling NAT requires IP Forwarding to be enabled.
Dial-out Number:
Remote/Dial-out Login:
Remote/Dial-out Password: Retype:
Restart Delay: 30 seconds
CBCP Server Allow No Callback: ☑
CBCP Client Type: ● Admin-defined Number ○ User-defined Number

Back to Device Ports

Apply Apply Settings: none to Device Ports:

Note: In addition to applying settings to the currently selected Device Port, all or some of the settings can also be applied to other Device Ports.

2. Enter the following:

Device Port Settings

Port	Displays number of port; displays automatically.
Mode	The status of the port; displays automatically.
Name	The name of the port. Valid characters are letters, numbers, dashes (-), periods, and underscores (_).
Group Access	If undefined, any group can access the device port. If one or more groups are specified (groups are delimited by the characters ' ' (space), ',' (comma), or ';' (semicolon)), then any user who logs into the device port must be a member of one of the specified groups, otherwise access will be denied. Users authenticated via RADIUS may have a group (or groups) provided by the RADIUS server via the Filter-Id attribute that overrides the group defined for a user on the SLC unit. A group provided by a remote server must be either a single group or multiple groups delimited by the characters ' ' (space), ',' (comma), ';' (semicolon), or '=' (equals) - for example "group=group1,group2;" or "group1,group2,group3".
Banner	Text to display when a user connects to a device port by means of Telnet, SSH, or TCP. If authentication is enabled for the device port, the banner displays once the user successfully logs in. Blank is the default.
Break Sequence	A series of one to ten characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as **x1bB**, which is hexadecimal (**x**) character 27 (**1B**) followed by a **B**.
View Port Log Seq	The key sequence used to view the Port Log while in Connect Direct mode. Non-printing characters can be specified by giving their hexidecimal code (see **Break Sequence** above). The default is **Esc+V** (\x1bV).
View Port Log	Select to allow the user to enter the View Port Log Sequence to view the Port Log during Connect Direct mode. The default is disabled.
Zero Port Counters	Resets all of the numerical values in the Port Counters table at the bottom of the page to zero (0).
Logging	Click the **Settings** link to configure file logging, email logging, and local logging.
Connected to	The type of device connected to the device port. Presently, the SLC console manager supports Lantronix’s Secure Lantronix Remote Power Manager (SLP8 and SLP16), SserverTech CDUs and Sensorsoft devices. If the type of device is not listed, select **undefined**. If you select anything other than **undefined**, click **Device Commands**. The appropriate web page displays.

IP Settings

Telnet In	Enables access to this port through Telnet. Disabled by default.
SSH In	Enables access to this port through SSH. Disabled by default.
TCP in	Enables access to this port through a raw TCP connection. Disabled by default: ***Note:*** *When using raw TCP connections to transmit binary data, or where the break command (escape sequence) is not required, set the* ***Break Sequence*** *of the respective device port to null (clear it).*
Port	Automatically assigned Telnet, SSH, and TCP port numbers. You may override this value, if desired.

Authentication	If selected, the SLC unit requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet** in and **SSH in**, but not for **TCP in**.
Timeout	To cause an idle Telnet, SSH or TCP connection to disconnect after a specified number of seconds, select the checkbox and enter a value from 1 to 1800 seconds. The default is no timeout.
Seconds	Number of seconds before a timeout.
IP Address /Netmask Bits	IP address used for this device port so a user can Telnet, SSH, or establish a raw TCP connection to this address and connect directly to the device port. The optional netmask bits specify the netmask to use for the IP address. For example, for a netmask of 255.255.255.0 specify 24 bits. If the netmask bits are not specified, a default netmask used for the class of network that the IP address falls in will be used. For Telnet and SSH, the default TCP port numbers (22 and 23, respectively) are used to connect to the device port. For raw TCP, the TCP port number defined for **TCP In** to the device port is used. ***Note:*** *If Ethernet Bonding is enabled, assigning individual IP Addresses to Device Ports is not supported. Note that the IP address will be bound to Eth1 only, so if Eth2 is connected and configured, and Eth1 is not, this feature will not work.*
Web SSH/Telnet Columns	Number of columns in the Web SSH/Telnet applet when this device port is accessed via the applet.
Rows	Number of rows in the Web SSH/Telnet applet when this device port is accessed via the applet.

Data Settings

Note: *Check the serial device's equipment settings and documentation for the proper settings. The device port and the attached serial device must have the same settings.*

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use 9600 for the administration port, so the device port defaults to this value. Check the equipment settings and documentation for the proper baud rate.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Stop Bits	The number of stop bit(s) used to indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.
Enable Logins	For serial devices connected to the device port, displays a login prompt and authenticates users. Successfully authenticated users are logged into the command line interface. The default is disabled. This is the correct setting if the device port is the endpoint for a network connection.
Max Direct Connects	Enter the maximum number (1-10) of simultaneous connections for the device port. The default is 1.

Show Lines on Connecting	If enabled, when the user either does a connect direct from the CLI or connects directly to the port using Telnet or SSH, the SLC console manager outputs up to 24 lines of buffered data as soon as the serial port is connected. For example, an SLC user issues a connect direct device 1 command to connect port 1 to a Linux server. Then the SLC user ls command to display a directory on the Linux server, then exits the connection. When the SLC user issues another direct connect device 1, the last 24 lines of the ls command is displayed so the user can see what state the server was left in.

Hardware Signal Triggers

Check DSR on Connect	If this setting is enabled, the device port only establishes a connection if DSR (Data Set Ready) is in an asserted state. DSR should already be in an asserted state, not transitioning to, when a connection attempt is made. Disabled by default unless dial-in, dial-out, or dial-back is enabled for the device port.
Disconnect on DSR	If a connection to a device port is currently in session, and the DSR signal transitions to a de-asserted state, the connection disconnects immediately. Disabled is the default unless dial-in, dial-out, or dial-back is enabled for the device port.

Modem Settings

*Note: Depending on the **State** and **Mode** you select, different fields are available.*

State	Indicates whether an external modem is attached to the device port. If enabling, set the modem to dial-out, dial-in, dial-back, CBCP server, CBCP client, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, or dial-in/host list. For more information on the different dialing types, see *Modem Dialing States (on page 136)*. Disabled by default.
Mode	The format in which the data flows back and forth: ◆ **Text:** In this mode, the SLC unit assumes that the modem will be used for remotely logging into the command line. Text mode can only be used for dialing in or dialing back. **Text** is the default. ◆ **PPP:** This mode establishes an IP-based link over the modem. PPP connections can be used in dial-out mode (e.g., the SLC console manager connects to an external network), dial-in mode (e.g., the external computer connects to the network that the SLC device is part of), or dial-on-demand.
Use Sites	Enables the use of site-oriented modem parameters which can be activated by various modem-related events (authentication, outbound network traffic for dial-on-demand connections, etc.). Sites can be used with the following modem states: dial-in, dial-back, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, and CBCP server.
Initialization Script	Commands sent to configure the modem may have up to 100 characters. Consult your modem's documentation for recommended initialization options. If you do not specify an initialization script, the SLC device uses a default initialization string of `AT S7=45 SO=0 L1 V1 X4 &D2 &c1 E1 Q0.` *Note: We recommend that the modem initialization script always be preceded with* `AT` *and include* `E1 V1 x4 Q0` *so that the SLC console manager may properly control the modem. For information on* `AT` *commands, refer to the modem user guide, or do a web search for* `at command set`*.*

Modem Timeout	Timeout for all modem connections. Select **Yes** (default) for the SLC unit to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds. The default is 30 seconds.
Caller ID Logging	Select to enable the SLC console manager to log caller IDs on incoming calls. Disabled by default. ***Note:*** *For the Caller ID `AT` command, refer to the modem user guide.*
Modem Command	Modem `AT` command used to initiate caller ID logging by the modem. ***Note:*** *For the `AT` command, refer to the modem user guide.*
Dial-back Number	Users with dial-back access can dial into the SLC device and enter their login and password. Once the SLC unit authenticates them, the modem hangs up and dials them back. Select the phone number the modem dials back on -a fixed number or a number associated with their login. If you select **Fixed Number**, enter the number (in the format 2123456789). The dial-back number is also used for CBCP client as the number for a user-defined number. See *Device Ports - Settings (on page 94)* for more information.
Dial-back Delay	For dial-back and CBCP Server, the number of seconds between the dial-in and dial-out portions of the dialing sequence.
Dial-back Retries	For dial-back and CBCP Server, the number of times the SLC console manager will retry the dial-out portion of the dialing sequence if the first attempt to dial-out fails.

Modem Settings: Text Mode

Timeout Logins	If you selected **Text** mode, you can enable logins to time out after the connection is inactive for a specified number of minutes. The default is **No**. This setting is only applicable for text mode connections. **PPP** mode connections stay connected until either side drops the connection. Disabled by default.
Dial-in Host List	From the drop-down list, select the desired host list. The host list is a prioritized list of SSH, Telnet, and TCP hosts that are available for establishing outgoing modem connections or for **connect direct** at the CLI. The hosts in the list are cycled through until the SLC console manager successfully connects to one. To establish and configure host lists, click the **Host Lists** link.

Modem Settings: PPP Mode

Negotiate IP Address	If the SLC unit and/or the serial device have dynamic IP addresses (e.g., IP addresses assigned by a DHCP server), select **Yes**. **Yes** is the default. If the SLC device or the modem have fixed IP addresses, select **No**, and enter the **Local IP** (IP address of the port) and **Remote IP** (IP address of the modem).
Authentication	Enables **PAP** or **CHAP** authentication for modem logins. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the CHAP Handshake fields authenticate the user.
CHAP Handshake	The **Host/User Name** (for UNIX systems) or **Secret/User Password** (for Windows systems) used for CHAP authentication. May have up to 128 characters.

CHAP Auth Uses	Select the method of CHAP Authorization: ◆ Through the CHAP Host user name and password established under CHAP Handshake. ◆ Through the username and password established under Local/Remote User database.
Same authentication for Dial-in & Dial-on-Demand (DOD)	Select this option to let incoming connections (dial-in) use the same authentication settings as outgoing connections (dial-on-demand). If this option is not selected, then the dial-on-demand connections take their authentication settings from the DOD parameter settings. If DOD Authentication is PAP, then the DOD CHAP Handshake field is not used.
DOD Authentication	Enables **PAP** or **CHAP** authentication for dial-in & dial-on-demand. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the DOD CHAP Handshake fields authenticate the user.
DOD CHAP Handshake	For **DOD Authentication**, enter the **Host/User Name** for UNIX systems) or **Secret/User Password** (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Enable NAT	Select to enable Network Address Translation (NAT) for dial-in and dial-out PPP connections on a per modem (device port or) basis. Users dialing into the SLC unit access the network connected to Eth1 and/or Eth2. *Note: IP forwarding must be enabled on the Network > Network Settings page for NAT to work. See Chapter 6: Basic Parameters on page 52.*
Dial-out Number	Phone number for dialing out to a remote system or serial device. May have up to 20 characters. Any format is acceptable.
Remote/Dial-out Login	User ID for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC when it dials in. May have up to 32 characters.
Remote/Dial-out Password	Password for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC when it dials in. May have up to 64 characters.
Retype	Re-enter remote/dial-out password for dialing out to a remote system. May have up to 64 characters.
Restart Delay	The number of seconds after the timeout and before the SLC console manager attempts another connection. The default is **30** seconds.
CBCP Server Allow No Callback	For CBCP Server state, allows "No Callback" as an option in the CBCP handshake in addition to User-defined Number and Admin-defined Number.
CBCP Client Type	For CBCP Client, this selects the number that the client would like to use for callback - either a user-defined number passed to the server (specified by the Fixed Dial-back Number) or an administrator-defined number determined by the server based on the login that is PAP or CHAP authenticated.

3. To save settings for just this port, click the **Apply** button.
4. To save selected settings to ports other than the one you are configuring:
   - From the **Apply Settings** drop-down box, select none, a group of settings, or All.
   - In to **Device Ports**, type the device port numbers, separated by commas; indicate a range of port numbers with a hyphen (e.g., 2, 5, 7-10).

Note: It may take a few minutes for the system to apply the settings to multiple ports.

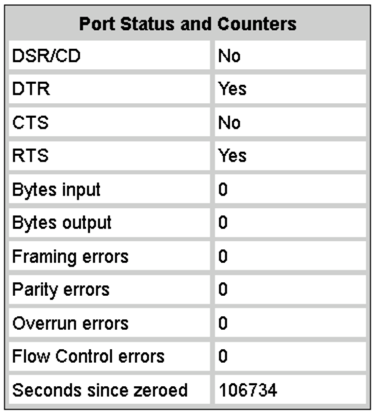
Port Status and Counters

Port Counters describe the status of signals and interfaces. SLC console manager updates and increments the port counters as signals change and data flows in and out of the system. These counters help troubleshoot connections or diagnose problems because they give the user an overview of the state of various parameters. By setting them to zero and then re-checking them later, the user can view changes in status.

The chart in the middle of the page displays the flow control lines and port statistics for the device port. The system automatically updates these values. To reset them to zeros, select the **Zero** port counters checkbox in the IP Settings section of the page.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, you must reload the web page.*

Table 8-5 Port Status and Counters



Port Status and Counters	
DSR/CD	No
DTR	Yes
CTS	No
RTS	Yes
Bytes input	0
Bytes output	0
Framing errors	0
Parity errors	0
Overrun errors	0
Flow Control errors	0
Seconds since zeroed	106734

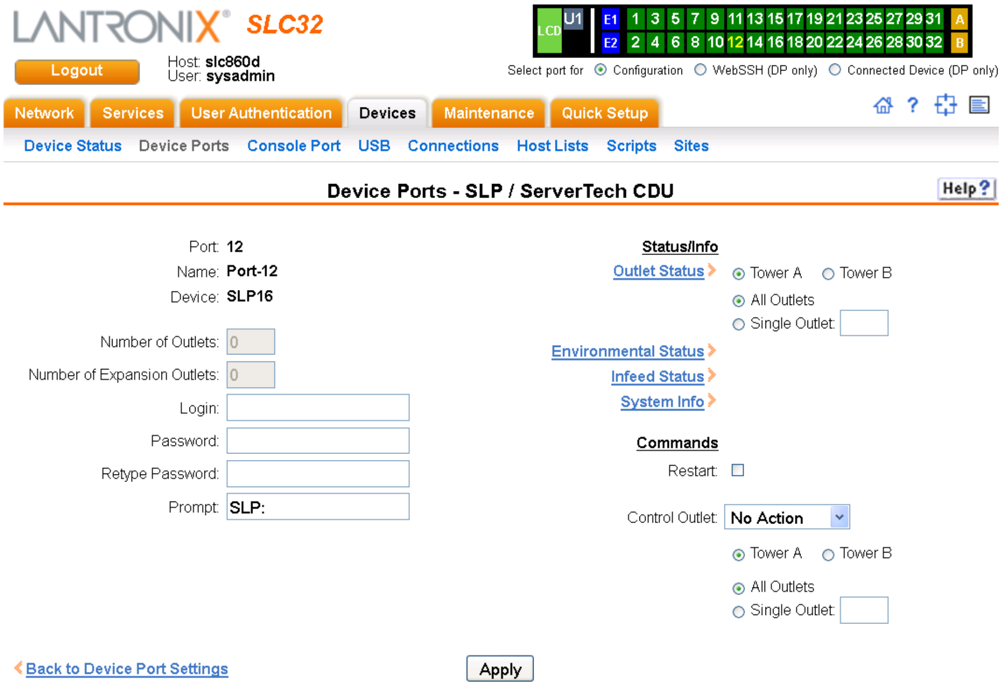
Device Ports - SLP / ServerTech CDU

On the *Device Ports > SLP* page, configure commands to send to a ServerTech CDU, SLP or SLP expansion chassis that expands the number of power ports.

To open the Device Ports - SLP page:

1. In the **Connected to** field above the IP Settings section of the *Device Port Settings* page, select an **SLP**, **SLPEXP** or **ServerTech CDU**.
2. Click the **Device Commands** link. The following page displays:

Figure 8-6 Device Ports > SLP


LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help ?
Back to Device Port Settings
Apply

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Device Ports - SLP / ServerTech CDU

Port: 12
Name: Port-12
Device: SLP16

Number of Outlets: 0
Number of Expansion Outlets: 0
Login:
Password:
Retype Password:
Prompt: SLP:

Status/Info
Outlet Status ● Tower A ○ Tower B
● All Outlets
○ Single Outlet:
Environmental Status
Infeed Status
System Info

Commands
Restart: □
Control Outlet: No Action
● Tower A ○ Tower B
● All Outlets
○ Single Outlet:

To enter SLP commands:

1. Enter the following:

Number of Outlets	Enter the number of outlets for a ServerTech CDU. This setting is not applicable for an SLP unit.
Number of Expansion Outlets	Enter the number of outlets for a ServerTech CDU expansion unit. This setting is not applicable for an SLP device.
Login	User ID for logging into the SLP or ServerTech CDU.
Password	Enter password for logging into the SLP or ServerTech CDU.
Retype Password	Re-enter password for logging into the SLP or ServerTech CDU.
Prompt	Enter the prompt displayed by the SLP unit or ServerTech CDU device. This will default to a typical prompt for an SLP power manager or ServerTech CDU. If you are unable to control the SLP unit or ServerTech CDU device, verify that the prompt is set to the right value.

Status/Info

Outlet Status	***Note:*** *If there is an SLP and an SLP Expansion chassis, the SLP is Tower A and the Expansion chassis is Tower B. This is also applicable to a or ServerTech CDU.* For **Tower A** or **Tower B**, select **All Outlets** or **Single Outlet** to view the status of all outlets or a single outlet of the SLP. If you select **Single Outlet**, enter a value of 1-8 for the SLP8 or 1-16 for the SLP16. For the ServerTech CDU, the valid range of outlets is specified by the Number of Outlets setting (for Tower A) or the Number of Expansion Outlets setting (for Tower B). Click the **Outlet Status** link to see the status of the selected outlet(s).

Environmental Status	Click the link to view the environmental status (e.g., temperature and humidity).
Infeed Status	Click the link to view the status of the data the SLP unit or ServerTech CDU is receiving.
System Info	Click the link to see system information pertaining to the SLP unit or ServerTech CDU.

SLP Commands

Restart SLP	To restart the SLP device or ServerTech CDU, select the checkbox.
Control Outlet	For **Tower A** or **Tower B**, select **All Outlets** or **Single Outlet** and the number of the outlet to be controlled (1-8 for the SLP8 or 1-16 for the SLP16) and select the command for the outlet (**No Action, On, Off, Cycle Power**). **No Action** is the default.

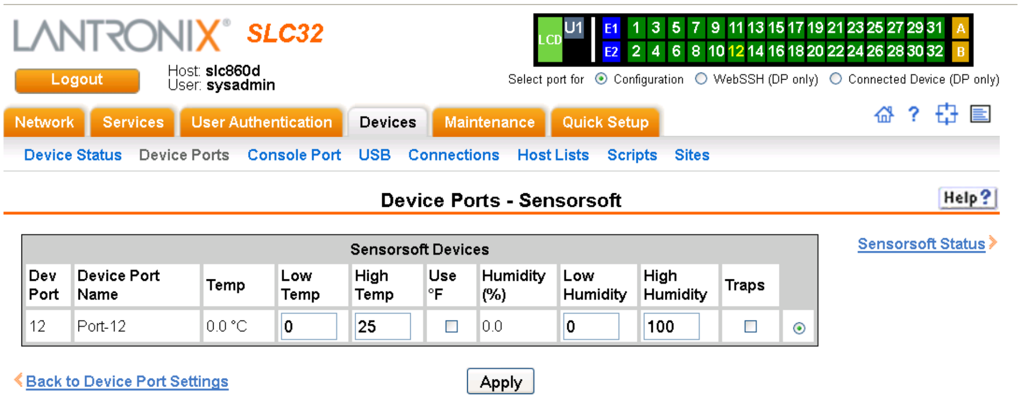
2. Click the **Apply** button.

Device Port - Sensorsoft Device

Devices made by Sensorsoft are used to monitor environmental conditions.

1. In the **Connected to** field above the IP Settings section of the *Device Port Settings* page, select **Sensorsoft**.
2. Click the **Device Commands** link. The following page displays:

Figure 8-7 Devices > Device Ports > Sensorsoft


LANTRONIX
SLC32
Logout
Host: slc860d
User: sysadmin
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help ?
Sensorsoft Status
Back to Device Port Settings
Apply

Device Ports - Sensorsoft

Sensorsoft Devices

Dev Port	Device Port Name	Temp	Low Temp	High Temp	Use °F	Humidity (%)	Low Humidity	High Humidity	Traps	
12	Port-12	0.0 °C	0	25	□	0.0	0	100	□	●

3. Select a port and enter or view the following information:

Dev Port	Displays the number of the SLC port.
Device Port Name	Displays the name of the SLC port.
Temp	Current temperature (degrees Celsius) on the device the sensor is monitoring.
Low Temp	Enter the temperature (degrees Celsius) permitted on the monitored device below which the SLC console manager sends a trap.
High Temp	Enter the temperature (degrees Celsius) permitted on the monitored device above which the SLC unit sends a trap.
Use °F	Display and set the temperature for this device in degrees Fahrenheit, instead of Celsius, which is the default.
Humidity (%)	Current relative humidity on the device the sensor is monitoring.

Low Humidity	Enter the relative humidity permitted on the device the sensor is monitoring below which the sensor sends a trap to the SLC console manager.
High Humidity	Enter the highest relative acceptable humidity permitted on the device above which the sensor sends a trap to the SLC unit.
Traps	Select to indicate the SLC device should send a trap or configured Event Alert when the sensor detects an out-of-range configured threshold.

4. Click the **Apply** button.
5. To view the status detected by the Sensorsoft, click the **Sensorsoft Status** link to the right of the table.

Device Port Commands

The following CLI commands correspond to the web page entries described above.

To configure a single port or a group of ports (for example, set deviceport port 2-5,6,12,15-16 baud 2400):

```
set deviceport port <Device Port List or Name> <one or more device port
parameters>
```

Parameters:

```
auth <pap|chap>
banner <Banner Text>
baud <300-115200>
breakseq <1-10 Chars>
calleridcmd <Modem Command String>
calleridlogging <enable|disable>
chapauth <chaphost|localusers>
chaphost <CHAP Host or User Name>
chapsecret <CHAP Secret or User Password>
```

The user defines the secret.

```
checkdsr <enable|disable>
closedsr <enable|disable>
databits <7|8>
device <none|slp8|slp16|slp8exp8|slp8exp16|slp16exp8|
        slp16exp16|sensorsoft|servertech>
dialbackretries <1-10>
dialbackdelay <PPP Dial-back Delay>
dialinlist <Host List for Dial-in>
dialoutnumber <Phone Number>
dialoutlogin <User Login>
dialoutpassword <Password>
dialbacknumber <usernumber|Phone Number>
dodauth <pap|chap>
dodchaphost <CHAP Host or User Name>
dodchapsecret <CHAP Secret or User Password>
flowcontrol <none|xon/xoff|rts/cts>
group <Local or Remote Group Name>
idletimeout <disable|1-9999 seconds>
ipaddr <IP Address>
initscript <Initialization Script>
```

A script that initializes a modem.

```
localipaddr <negotiate|IP Address>
logins <enable|disable>
modemmode <text|ppp>
modemstate <disable|dialout|dialin|dialback|dialondemand|
dialin+dialondemand|dialinhostlist>
modemtimeout <disable|1-9999 seconds>
name <Device Port Name>
nat <enable|disable>
parity <none|odd|even>
remoteipaddr <negotiate|IP Address>
restartdelay <PPP Restart Delay>
showlines <enable|disable>
sshauth <enable|disable>
sshin <enable|disable>
sshport <TCP Port>
stopbits <1|2>
tcpauth <enable|disable>
tcpin <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetin <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable or 1-30>
usesites <enable|disable>
webcolumns <Web SSH/Telnet Cols>
webrows <Web SSH/Telnet Rows>
```

To view the settings for one or more device ports:

```
show deviceport port <Device Port List or Name>
```

To view a list of all device port names:

```
show deviceport names
```

To view the modes and states of one or more device port(s):

Note: *You can optionally email the displayed information.*

```
show portstatus [deviceport <Device Port List or Name>] [email <Email
Address>]
```

To view device port statistics and errors for one or more ports:

Note: *You can optionally email the displayed information.*

```
show portcounters [deviceport <Device Port List or Name>] [email <Email
Address>]
```

To zero the port counters for one or more device ports:

```
show portcounters zerocounters <Device Port List or Name>
```

Device Commands

The following CLI commands correspond to the web page entries described above.

To send commands to (or control) a device connected to an SLC device port over the serial port:

Note: *Currently the only devices supported for this type of interaction are the SLP, ServerTech CDU and Sensorsoft devices.*

```
set command
```

Syntax

```
set command <Device Port # or Name or List> <one or more parameters>
```

Parameters

```
slp|servertech auth login <User Login>
```

Establishes the authentication information to log into the SLP or ServerTech CDU attached to the device port.

```
slp|servertech restart
```

Issues the CLI command the SLP or ServerTech CDU uses to restart itself.

```
slp|servertech outletcontrol state <on|off|cyclepower> [outlet <Outlet
#>][tower <A|B>]
```

Outlet # is 1-8 for SLP8 and 1-16 for SLP16. For the ServerTech CDU, the valid range of outlets is specified by the number of outlets settings (for Tower A) or number of expansion outlets settings (for Tower B) - see below.

The `outletcontrol` parameters control individual outlets.

```
slp|servertech outletstate [outlet <Outlet #>] [tower <A|B>]
```

The outletstate parameter shows the state of all outlets or a single outlet.

```
slp|servertech envmon
```

Displays the environmental status (e.g., temperature and humidity) of the SLP or ServerTech CDU.

```
slp|servertech infeedstatus
```

Displays the infeed status and load of the SLP or ServerTech CDU.

```
slp|servertech system
```

Displays the system configuration information, such as firmware, revision and uptime.

```
slp|servertech config [prompt <Command Prompt>]
```

Enter the prompt displayed by the SLP or ServerTech CDU device. This will default to a typical prompt for an SLP or ServerTech CDU. If you are unable to control the SLP or ServerTech CDU device, verify that the prompt is set to the right value.

```
                      [numoutlets <Number of Outlets>]
                      [numexpoutlets <Number of Expansion Outlets>]
```

Enter the number of outlets for a ServerTech CDU main unit or the number of outlets for a Server Tech CDU expansion unit. This setting is not applicable for an SLP.

```
sensorsoft lowtemp <Low Temperature in C.>
```

Sets the lowest temperature permitted for the port.

```
sensorsoft hightemp <High Temperature in C.>
```

Sets the hightest temperature permitted for the port.

```
sensorsoft lowhumidity <Low Humidity %>
```

Sets the lowest humidity pemitted for the port.

```
sensorsoft highhumidity <High Humidity %>
```

Sets the lowest humidity permitted for the port.

```
sensorsoft traps <enable|disable>
```

Enables or disables temperature settings as celcius or fahrenheit.

```
sensorsoft degrees <celsius|fahrenheit>
```

Enables or disables traps when specified conditions are met.

```
sensorsoft status
```

Displays the status of the port.

Interacting with a Device Port

Once a device port has been configured and connected to an external device such as the console port of an external server, the data received over the device port can be monitored at the command line interface with the connect listen command, as follows:

To connect to a device port to monitor it:

```
connect listen deviceport <Port # or Name>
```

In addition, you can send data out the device port (for example, commands issued to an external server) with the connect direct command, as follows:

To connect to a device port to monitor and/or interact with it, or to establish an outbound network connection:

```
connect direct <endpoint>
```

endpoint is one of:

```
deviceport <Port # or Name>
ssh <IP Address> [port <TCP Port>][<SSH flags>]
```

where:

```
<SSH flags> is one or more of:
user <Login Name>
version <1|2>
command <Command to Execute>
tcp <IP Address> port <TCP Port>
telnet <IP Address> [port <TCP Port>]
udp <IP Address> port <UDP Port>
hostlist <Host List>
```

Note: *To escape from the* `connect direct` *command when the endpoint of the command is* `deviceport`, `tcp`, *or* `udp` *and return to the command line interface, type the* *escape sequence assigned to the currently logged in user. If the endpoint is* `telnet` *or* `SSH`*, logging out returns the user to the command line prompt.*

Note: *To escape from the* `connect listen` *command, press any key.*

Setting up a user with an escape sequence is optional. For any NIS, LDAP, RADIUS, Kerberos, or TACACS+ user, or any local user who does not have an escape sequence defined, the default escape sequence is Esc+A.

Device Ports - Logging

The SLC products support port buffering of the data on the system's device ports as well as notification of receiving data on a device port. Port logging is disabled by default. You can enable more than one type of logging (local, NFS file, email/SNMP, or USB port) at a time. The buffer containing device port data is cleared when any type of logging is enabled.

Local Logging

If local logging is enabled, each device port stores 256 Kbytes (approximately 400 screens) of I/O data in a true FIFO buffer. You may view this data (in ASCII format) at the CLI with the `show locallog` command or on the *Devices > Device Ports - Logging* page. Buffered data is normally stored in RAM and is lost in the event of a power failure if it is not logged using an NFS mount solution. If the buffer data overflows the buffer capacity, only the oldest data is lost, and only in the amount of overrun (not in large blocks of memory).

NFS File Logging

Data can be logged to a file on a remote NFS server. Data logged locally to the SLC is limited to 256 Kbytes and may be lost in the event of a power loss. Data logged to a file on an NFS server does not have these limitations. The system administrator can define the directory for saving logged data on a port-by-port basis and configure file size and number of files per port.

The directory path must be the local directory for one of the NFS mounts. For each logging file, once the file size reaches the maximum, a new file opens for logging. Once the number of files reaches the maximum, the oldest file is overwritten. The file naming convention is: <Device Port Number>_<Device Port Name>_<File number>.log.

Examples:

```
02_Port-2_1.log
02_Port-2_2.log
02_Port-2_3.log
02_Port-2_4.log
02_Port-2_5.log
```

USB Flash Drive Logging

Data can be logged to a USB flash drive that is loaded into the USB port on the front of the SLC unit (see *USB Port on page 148*). Data logged locally to the SLC device is limited to 256 Kbytes and may be lost in the event of a power loss. Data logged to a USB flash drive does not have these limitations. The system administrator can define the file size and number of files per port. For each logging file, once the file size reaches the maximum, a new file opens for logging. Once the number of files reaches the maximum, the oldest file is overwritten. The file naming convention is: `<Device Port Number>_<Device Port Name>_<File number>.log`.

Examples:

```
02_Port-2_1.log
02_Port-2_2.log
02_Port-2_3.log
02_Port-2_4.log
02_Port-2_5.log
```

PC Card Logging

Data can be logged to a PC card that is loaded into PC card slot on the front of the SLC unit (see *PC Cards on page 140*). Data logged locally to the SLC device is limited to 256 Kbytes and may be lost in the event of a power loss. Data logged to a PC card does not have these limitations. The system administrator can define the file size and number of files per port. For each logging file, once the file size reaches the maximum, a new file opens for logging. Once the number of files reaches the maximum, the oldest file is overwritten. The file naming convention is: `<Device Port Number>_<Device Port Name>_<File number>.log`.

Examples:

```
02_Port-2_1.log
02_Port-2_2.log
02_Port-2_3.log
02_Port-2_4.log
02_Port-2_5.log
```

Email/SNMP Notification

The system administrator can configure the SLC console manager to send an email alert message indicating a particular condition detected in the device port log to the appropriate parties or an SNMP trap to the designated NMS (see *Chapter 7: Services on page 68*). The email or trap is triggered when a user-defined number of characters in the log from your server or device is exceeded, or a specific sequence of characters is received.

Use the *Device Ports - SLP / ServerTech CDU (on page 101)* to set logging parameters on individual ports.

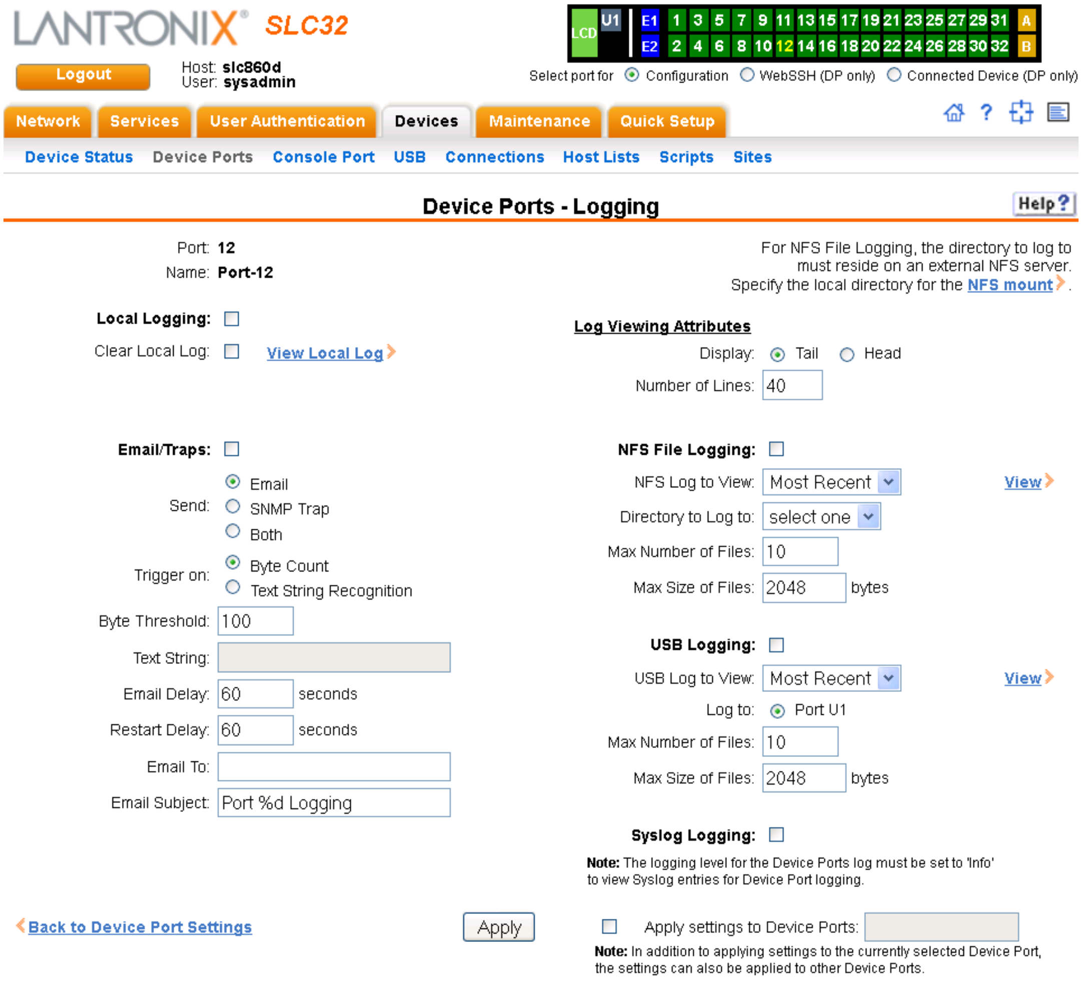
Sylogs Logging

Data can be logged to the system log. If this feature is enabled, the data will appear in the Device Ports log, under the Info level. The log level for the Device Ports log must be set to Info for the data to be saved to the system log. (See *Chapter 7: Services on page 68*.)

To set logging parameters:

1. In the top section of the *Device Port Settings* page, click the **Settings** link in the Logging field. The following page displays:

Figure 8-8 Devices > Device Ports - Logging


LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help?
View Local Log
View
View
Back to Device Port Settings
Apply

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Device Ports - Logging

Port: 12
Name: Port-12

For NFS File Logging, the directory to log to must reside on an external NFS server. Specify the local directory for the NFS mount.

Local Logging: □
Clear Local Log: □

Log Viewing Attributes
Display: ● Tail ○ Head
Number of Lines: 40

Email/Traps: □
Send: ● Email ○ SNMP Trap ○ Both
Trigger on: ● Byte Count ○ Text String Recognition
Byte Threshold: 100
Text String:
Email Delay: 60 seconds
Restart Delay: 60 seconds
Email To:
Email Subject: Port %d Logging

NFS File Logging: □
NFS Log to View: Most Recent
Directory to Log to: select one
Max Number of Files: 10
Max Size of Files: 2048 bytes

USB Logging: □
USB Log to View: Most Recent
Log to: ● Port U1
Max Number of Files: 10
Max Size of Files: 2048 bytes

Syslog Logging: □

Note: The logging level for the Device Ports log must be set to 'Info' to view Syslog entries for Device Port logging.

□ Apply settings to Device Ports:

Note: In addition to applying settings to the currently selected Device Port, the settings can also be applied to other Device Ports.

2. Enter the following:

Local Logging

Local Logging	If you enable local logging, each device port stores 256 Kbytes (approximately 400 screens) of I/O data in a true FIFO buffer. Disabled by default.
Clear Local Log	Select the checkbox to clear the local log.
View Local Log	Click this link to see the local log in text format.

Email/SNMP Traps

Email/Traps	Select the checkbox to enable email and SNMP logging. Email logging sends an email message to pre-defined email addresses or an SNMP trap to the designated NMS (see *Chapter 7: Services on page 68*) when alert criteria are met. Disabled by default.
Send	If you enabled email and SNMP logging, select what type of notification log to send: ◆ Email (default) ◆ SNMP Trap ◆ Both

Trigger on	Select the method of triggering a notification: ◆ **Byte Count:** A specific number of bytes of data. This is the default. ◆ **Text String Recognition:** A specific pattern of characters, which you can define by a regular expression. ***Note:*** *Text string recognition may negatively impact the SLC unit's performance, particularly when regular expressions are used.*
Byte Threshold	The number of bytes of data the port receives before the SLC console manager captures log data and sends a notification regarding this port. The default is 100 bytes. In most cases, the console port of your device does not send any data unless there is an alarm condition. After the SLC device receives a small number of bytes, it perceives that your device needs some attention. The SLC unit notifies your technician when that point has been passed, and the notification includes the logged data. For example, a threshold preset at 30 characters means that as soon as the SLC console manager receives 30 bytes of data, it captures log data and sends an email regarding this port.
Text String	The specific pattern of characters the SLC unit must recognize before sending a notification to the technician about this port. The maximum is 100 characters. You may use a regular expression to define the pattern. For example, the regular expression "abc[def]g" recognizes the strings abcdg, abceg, abcfg. The SLC console manager supports GNU regular expressions; for more information, see: ◆ http://www.codeforge.com/help/GNURegularExpr.html ◆ http://www.delorie.com/gnu/docs/regex/regex.html
Email Delay	A time limit of how long (in seconds), after the SLC unit detects the trigger, that the device port captures data before closing the log file (with a fixed internal buffer maximum capacity of 1500 bytes) and sending a notification. The default is **60** seconds.
Restart Delay	The number of seconds for the period after the notification has been sent during which the device port ignores additional characters received. The data is simply ignored and does not trigger additional alarms until this time elapses. The default is **60** seconds.
Email to	The complete email address of the message recipient(s) for each device port(s). Each device port has its own recipient list. To enter more than one email address, separate the addresses with a **single space**. You can enter up to 128 characters.
Email Subject	A subject text appropriate for your site. May have up to 128 characters. The email subject line is pre-defined for each port with its port number. You can use the email subject to inform the desired recipients of the problem on a certain server or location (e.g., server location or other classification of your equipment). This is helpful if the email message goes to the system administrator's or service technician's mobile or wireless device (e.g., text messaging by means of email). ***Note:*** *The character sequence **%d** anywhere in the email subject is replaced with the device port number automatically.*

Log Viewing Attributes

Displays	Select to view either the beginning (head) or end (tail) of the log.
Number of Lines	Number of lines from the head or tail of the log to display.

NFS File Logging

NFS File Logging	Select the checkbox to log all data sent to the device port to one or more files on an external NFS server. Disabled by default.
NFS Log to View	Available log files in the selected NFS Directory to view.
Directory to Log to	The path of the directory where the log files will be stored. ***Note:*** *This directory must be a directory exported from an NFS server mounted on the SLC unit. Specify the local directory path for the NFS mount.*
Max Number of Files	The maximum number of files to create to contain log data to the port. These files keep a history of the data received from the port. Once this limit is exceeded, the oldest file is overwritten. The default is **10**.
Max Size of Files	The maximum allowable file size in bytes. The default is **2048** bytes. Once the maximum size of a file is reached, the SLC console manager begins generating a new file.

USB/PC Card Logging

USB/PC Card Logging	Select to enable USB/PC Card logging. ◆ A **PC Card** Compact Flash must be loaded into one of the PC Card slots of the SLC unit and properly mounted. ◆ A **USB** flash drive must be loaded into the SLC unit. ◆ **Disabled** by default.
USB/PC Card Log to View	Available log files in the selected USB port or PC card slot to view.
Log To	Select the USB port or PC card slot to use for logging.
Max Number of Files	The maximum number of files to create to contain log data to the port. These files keep a history of the data received from the port. Once this limit is exceeded, the oldest file is overwritten. The default is 10.
Max Size of Files	The maximum allowable file size in bytes. The default is 2048 bytes. Once the maximum size of a file is reached, the SLC unit begins generating a new file. The default is 2048 bytes.

Syslog Logging

Syslog Logging	Select to enable system logging. ***Note:*** *The logging level for the device ports log must be set to Info to view Syslog entries for Device Port logging on the Services > SSH/Telnet/Logging page.*
Apply settings to Device Ports	Check checkbox to apply settings to other device ports in addition to the currently selected port, and enter port numbers separated by commas. Indicate a range of port numbers with a hyphen (e.g., 2, 5, 7-10), and separate ranges with commas.

3. To save, click the **Apply** button.

Logging Commands

The following CLI commands correspond to the web page entries described above.

To configure logging settings for one or more device ports:

```
set deviceport port <Device Port List or Name> <one or more deviceport
parameters>
```

Note: *Local logging must be enabled for a device port for the* `locallog` *commands to be executed. To use the set locallog clear command, the user must have permission to clear port buffers (see Chapter 12: User Authentication on page 165).*

Example:

```
set deviceport port 2-5,6,12,15-16 baud 2400 locallogging enable
```

Parameters:

```
emaildelay <Email Delay>
emaillogging <disable|bytecnt|charstr>
emailrestart <Restart Delay>
emailsend <email|trap|both>
emailstring <Regex String>
emailsubj <Email Subject>
emailthreshold <Byte Threshold>
emailto <Email Address>
filedir <Logging Directory>
filelogging <enable|disable>
filemaxfiles <Max # of Files>
filemaxsize <Max Size of Files>
locallogging <enable|disable>
name <Device Port Name>
nfsdir <Logging Directory>
nfslogging <enable|disable>
nfsmaxfiles <Max # of Files>
nfsmaxsize <Size in Bytes>
sysloglogging <enable|disable>
usblogging <enable|disable>
usbmaxfiles <Max # of Files>
usbmaxsize <Size in Bytes>
usbport <U1>
pccardlogging <enable|disable>
pccardmaxfiles <Max # of Files>
pccardmaxsize <Size in Bytes>
pccardslot <upper|lower>
```

To view a specific number of bytes of data for a device port:

```
show locallog <Device Port # or Name> [bytes <Bytes To Display>]
```

1 Kbyte is the default.

To clear the local log for a device port:

```
set locallog clear <Device Port # or Name>
```

Note: *The* `locallog` *commands can only be executed for a device port if local logging is enabled for the port. The set* `locallog clear` *command can only be executed if the user has permission to clear port buffers (see Chapter 12: User Authentication on page 165).*

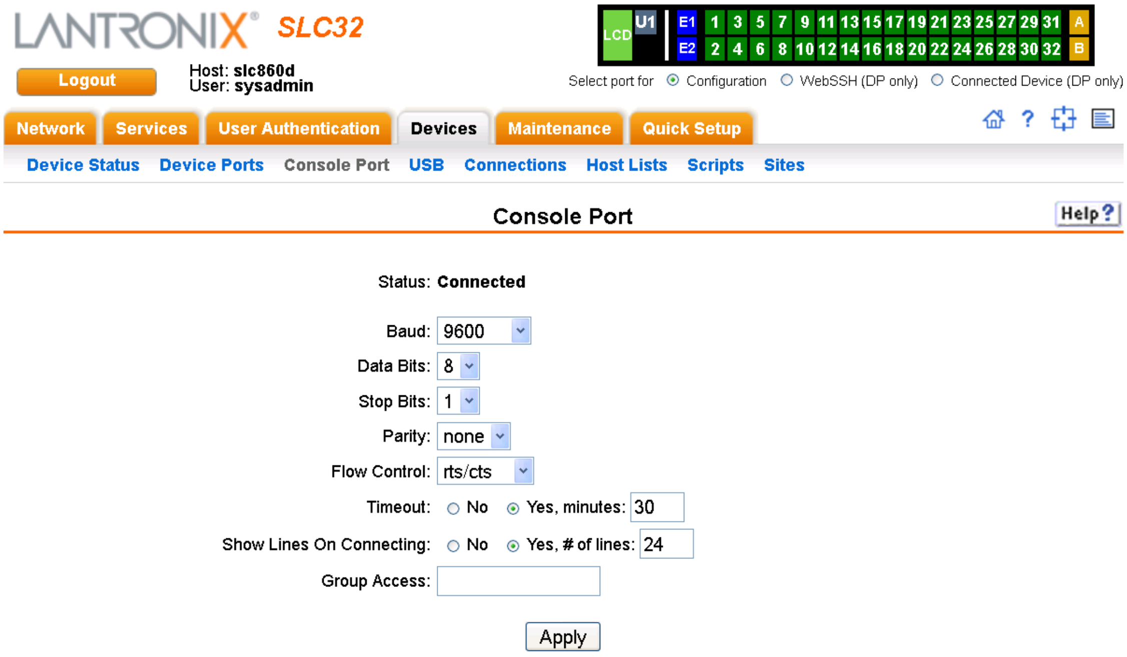
Console Port

The console port initially has the same defaults as the device ports. Use the *Devices > Console Port* page to change the settings, if desired.

To set console port parameters:

1. Click the **Devices** tab and select **Console Port**. The following page displays:

Figure 8-9 Devices > Console Port



Host: slc860d
User: sysadmin

Console Port

Status: Connected

Baud: 9600
Data Bits: 8
Stop Bits: 1
Parity: none
Flow Control: rts/cts
Timeout: ○ No ● Yes, minutes: 30
Show Lines On Connecting: ○ No ● Yes, # of lines: 24
Group Access:

2. Change the following as desired:

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use **9600** for the administration port, so the console port defaults to this value.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Stop Bits	The number of stop bits that indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.
Timeout	The number of minutes (1-30) after which an idle session on the console is automatically logged out. Disabled by default.
Show Lines on Connecting	If selected, when you connect to the console port with a terminal emulator, you will see the last lines output to the console, for example, the SLC boot messages or the last lines output during a CLI session on the console.

Group Access	If undefined, any group can access the console port. If one or more groups are specified (groups are delimited by the characters ' ' (space), ',' (comma), or ';' (semicolon)), then any user who logs into the console port must be a member of one of the specified groups, otherwise access will be denied. Users authenticated via RADIUS may have a group (or groups) provided by the RADIUS server via the Filter-Id attribute that overrides the group defined for a user on the SLC console manager. A group provided by a remote server must be either a single group or multiple groups delimited by the characters ' ' (space), ',' (comma), ';' (semicolon), or '=' (equals) - for example "group=group1,group2;" or "group1,group2,group3".

3. Click the **Apply** button to save the changes.

Console Port Commands

The following CLI commands correspond to the web page entries described above.

To configure console port settings:

```
set consoleport <one or more parameters>
```

Parameters:

```
baud <300->
databits <7|8>
stopbits <1|2>
group <Local or Remote Group Name>
parity <none|odd|even>
flowcontrol <none|xon/xoff|rts/cts>
showlines <enable|disable>
timeout <disable|1-30>
```

To view console port settings:

```
show consoleport
```

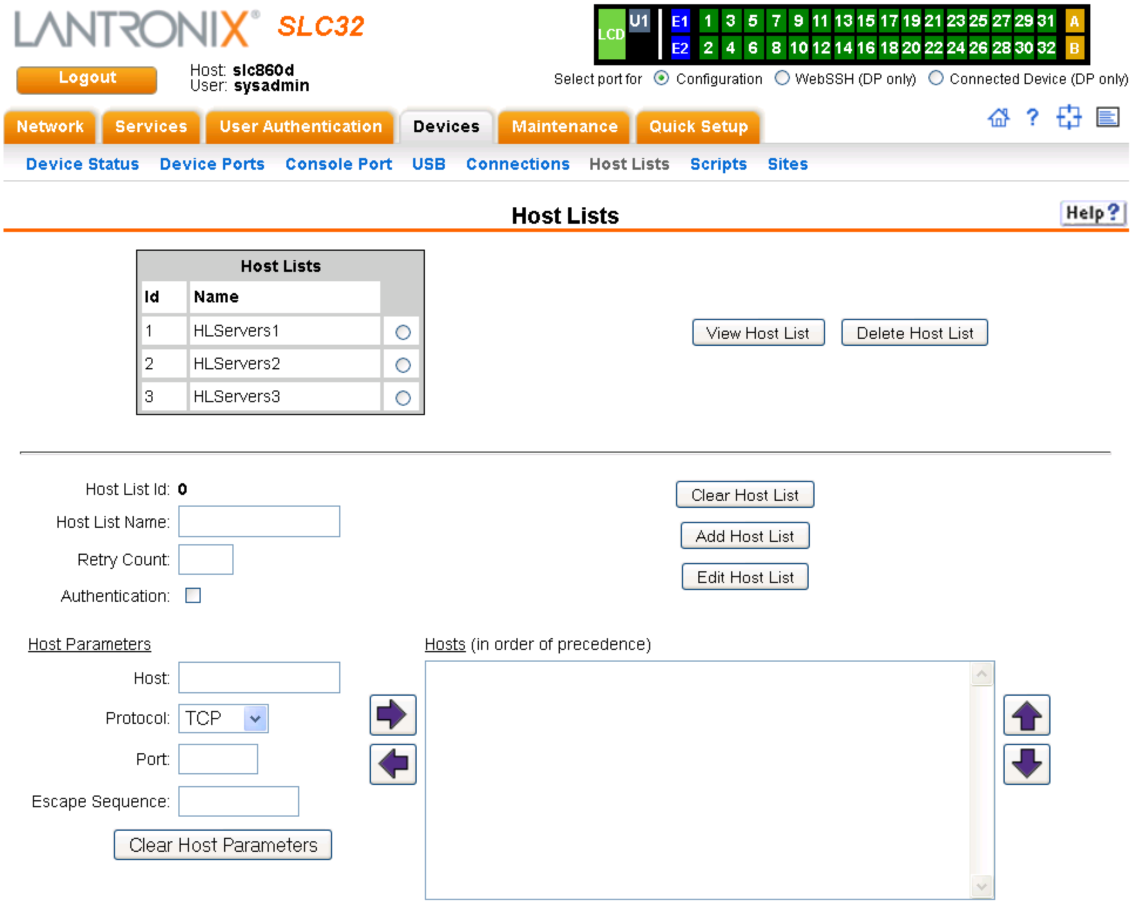
Host Lists

A host list is a prioritized list of SSH, Telnet, and TCP hosts available for establishing incoming modem connections or for the connect direct command on the CLI. The SLC console manager cycles through the list until it successfully connects to one.

To add a host list:

1. Click the **Devices** tab and select the **Host Lists** option. The following page displays:

Figure 8-10 Devices > Host Lists



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Host Lists

Host Lists

Id	Name	
1	HLServers1	○
2	HLServers2	○
3	HLServers3	○

Host List Id: 0

Host List Name:

Retry Count:

Authentication: □

Host Parameters

Host:

Protocol: TCP

Port:

Escape Sequence:

Hosts (in order of precedence)

2. Enter the following:

Note: *To clear fields in the lower part of the page, click the **Clear Host List** button.*

Host List Id	Displays after a host list is saved.
Host List Name	Enter a name for the host list.
Retry Count	Enter the number of times the SLC console manager should attempt to retry connecting to the host list.
Authentication	Select to require authentication when the SLC unit connects to a host.

3. You have the following options:

   - To save the host list without adding hosts at this time, click the **Add Host List** button.
   - To add hosts, enter the following:

Host Parameters

Host	Name or IP address of the host.
Protocol	Protocol for connecting to the host (TCP, SSH, or Telnet).

Port	Port on the host to connect to.
Escape Sequence	The escape character used to get the attention of the SSH or Telnet client. It is optional, and if not specified, Telnet and SSH use their default escape character. For Telnet, the escape character is either a single character or a two-character sequence consisting of '^' followed by one character. If the second character is '?', the DEL character is selected. Otherwise, the second character is converted to a control character and used as the escape character. For SSH, the escape character is a single character.

4. Click the right ➡ arrow. The host displays in the Hosts box.
5. Repeat steps 2-4 to add more hosts to the host list.

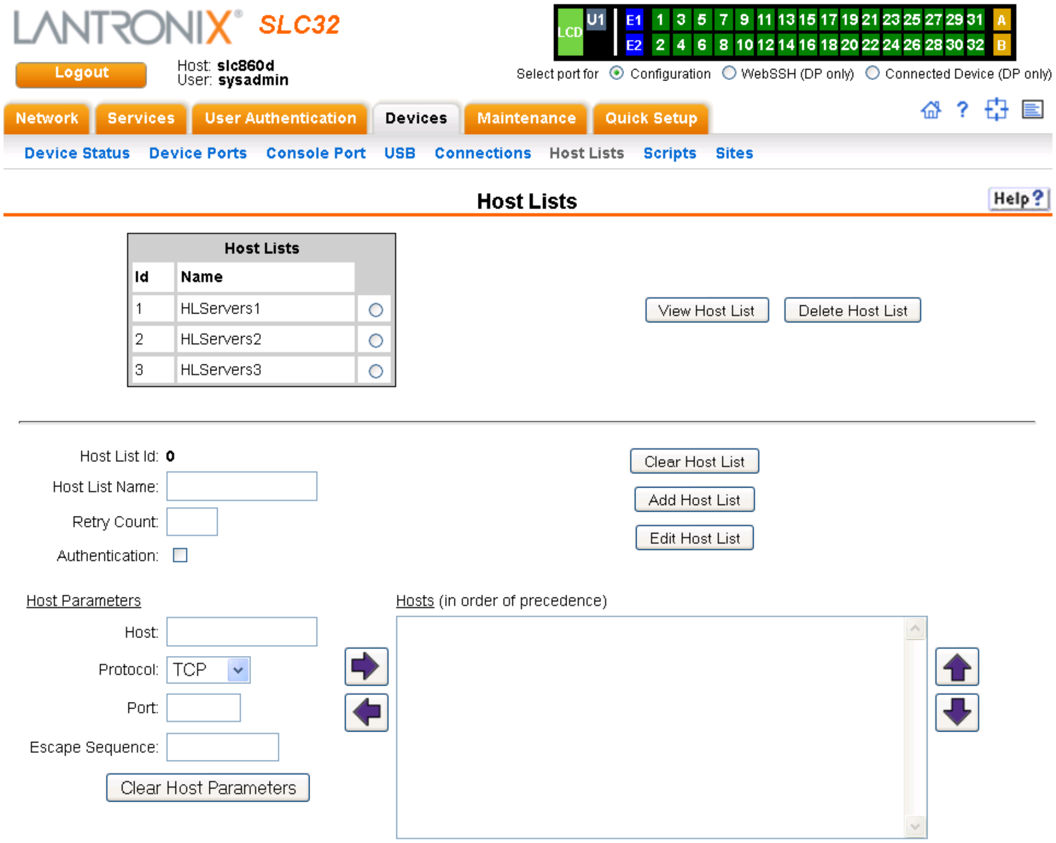
Note: *To clear fields before adding the next host, click the **Clear Host Parameters** button.*

6. You have the following options:
   - To remove a host from the host list, select the host in the Hosts box and click the left ⬅ arrow.
   - To give the host a higher precedence, select the host in the Hosts box and click the up ⬆ arrow.
   - To give the host a lower precedence, select the host in the Hosts box and click the down ⬇ arrow.
7. Click the **Add Host List** button. After the process completes, a link back to the *Device Ports > Settings* page displays.

To view or update a host list:

1. In the Host Lists table, select the host list and click the **View Host List** button. The list of hosts display in the Hosts box.

Figure 8-11 View Host Lists



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Host Lists

Host Lists		
Id	Name	
1	HLServers1	○
2	HLServers2	○
3	HLServers3	○

Host List Id: **0**
Host List Name:
Retry Count:
Authentication: □

Host Parameters
Host:
Protocol: TCP
Port:
Escape Sequence:

Hosts (in order of precedence)

2. View, add, or update the following:

Host List Id	Displays after a host list is saved.
Host List Name	Enter a name for the host list.
Retry Count	Enter the number of times the SLC console manager should attempt to retry connecting to the host list.
Authentication	Select to require authentication when the SLC unit connects to a host.

Host Parameters

Host	Name or IP address of the host.
Protocol	Protocol for connecting to the host (TCP, SSH, or Telnet).
Port	Port on the host to connect to SLC console manager.
Escape Sequence	The escape character used to get the attention of the SSH or Telnet client. It is optional, and if not specified, Telnet and SSH use their default escape character. For Telnet, the escape character is either a single character or a two-character sequence consisting of '^' followed by one character. If the second character is '?', the DEL character is selected. Otherwise, the second character is converted to a control character and used as the escape character. For SSH, the escape character is a single character.

3. You have the following options:

- To add a host to the host list, click the right ➡ arrow. The host displays in the Hosts box.

- To remove a host from the host list, select the host in the Hosts box and click the left ⬅ arrow.
- To give the host a higher precedence, select the host in the Hosts box and click the up ⬆ arrow.
- To give the host a lower precedence, select the host in the Hosts box and click the down ⬇ arrow.

4. Click the **Edit Host List** button. After the process completes, a link back to the *Device Ports > Settings* page displays.

To delete a host list:

1. Select the host list in the Host Lists table.
2. Click the **Delete Host List** button. After the process completes, a link back to the *Device Ports > Settings* page displays.

Host List Commands

The following CLI commands correspond to the web page entries described above.

To configure a prioritized list of hosts to be used for modem dial-in connections:

```
set hostlist add|edit <Host List Name> [<parameters>]
```

Parameters:

```
name <Host List Name> (edit only)
retrycount <1-10>
```

Default is 3.

```
auth <enable|disable>
```

To add a new host entry to a list or edit an existing entry:

```
set hostlist add|edit <Host List Name> entry <Host Number> [<parameters>]
```

Parameters:

```
host <IP Address or Name>
protocol <ssh|telnet|tcp>
port <TCP Port>
escapeseq <1-10 Chars>
```

To move a host entry to a new position in the host list:

```
set hostlist edit <Host List Name> move <Host Number> position <Host
Number>
```

To delete a host list, or a single host entry from a host list:

```
set hostlist delete <Host List> [entry <Host Number>]
```

To display the members of a host list:

```
show hostlist <all|names|Host List Name>
```

Scripts

The SLC console manager supports two types of scripts:

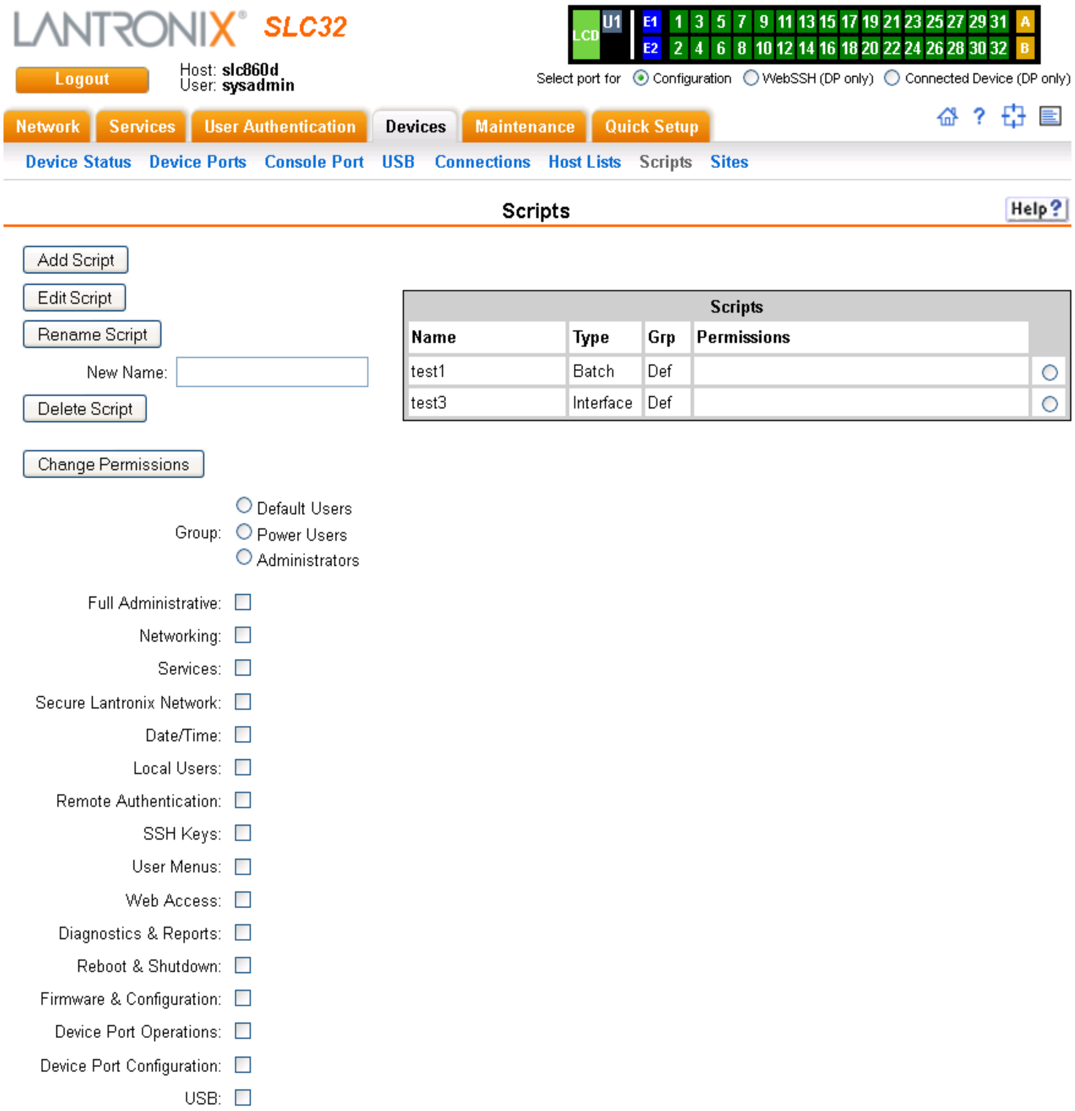
- **Interface Scripts** which use a subset of the Expect/Tcl scripting language to perform pattern detection and action generation on Device Port output.
- **Batch Scripts** which are a series of CLI commands. A user can create scripts at the web, view scripts at the web and the CLI, and utilize scripts at the CLI. For a description of the syntax allowed in Interface Scripts, see Interface Script Syntax at the end of this page.

All scripts have permissions associated with them; a user who runs a script must have the permissions associated with the script in order to run the script.

To add a script:

1. Click the **Devices** tab and select the **Scripts** option. This page displays.

Figure 8-12 Devices > Scripts



Host: **slc860d**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Scripts

New Name:

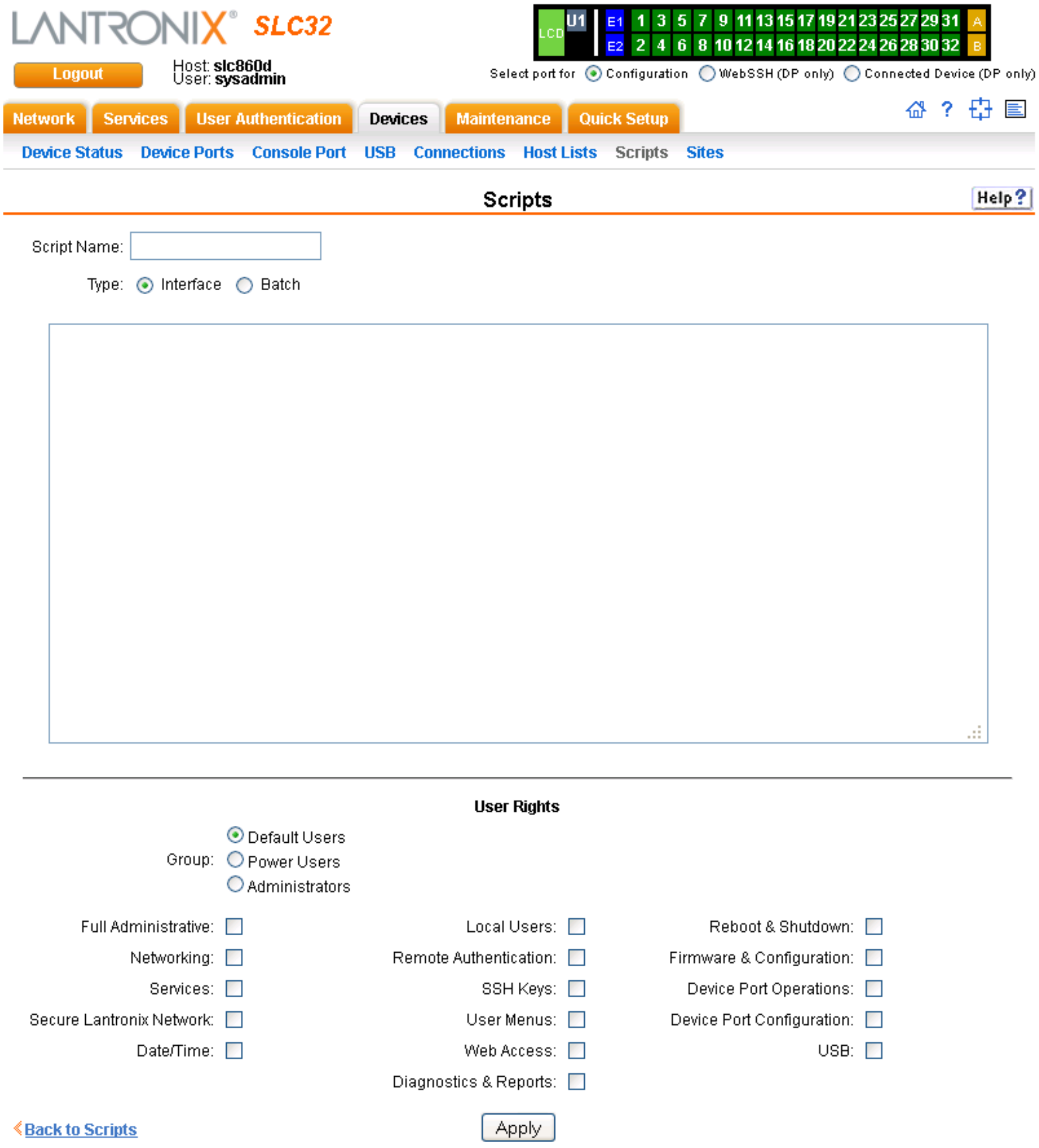
Scripts				
Name	**Type**	**Grp**	**Permissions**	
test1	Batch	Def		○
test3	Interface	Def		○

Group: ○ Default Users ○ Power Users ○ Administrators

Full Administrative: □
Networking: □
Services: □
Secure Lantronix Network: □
Date/Time: □
Local Users: □
Remote Authentication: □
SSH Keys: □
User Menus: □
Web Access: □
Diagnostics & Reports: □
Reboot & Shutdown: □
Firmware & Configuration: □
Device Port Operations: □
Device Port Configuration: □
USB: □

2. Click the **Add Scripts** button. The page for editing script attributes displays.

Figure 8-13 Adding or Editing New Scripts



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Scripts

Script Name:

Type: ● Interface ○ Batch

User Rights

Group: ● Default Users ○ Power Users ○ Administrators

Full Administrative:	□	Local Users:	□	Reboot & Shutdown:	□
Networking:	□	Remote Authentication:	□	Firmware & Configuration:	□
Services:	□	SSH Keys:	□	Device Port Operations:	□
Secure Lantronix Network:	□	User Menus:	□	Device Port Configuration:	□
Date/Time:	□	Web Access:	□	USB:	□
		Diagnostics & Reports:	□		

3. Enter the following:

Scripts

Script Name	A unique identifier for the script.
Type	◆ Select **Interface** for a script that utilizes Expect/Tcl to perform pattern detection and action generation on Device Port output. ◆ Select **Batch** for a script of CLI commands.

4. In the **User Rights** section, select the user **Group** to which NIS users will belong:

User Rights

Group	Select the group to which the NIS users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user . ◆ **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. ◆ **Administrators:** This group has all possible rights.

5. Assign or unassign **User Rights** for the specific user by checking or unchecking the following boxes:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, SLC and SLB units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for NIS users.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC console manager and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects Reboot & Shutdown.
Device Port Operations	Right to control device ports.
Device Port Settings	Right to enter device port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

6. To save, click the **Apply** button. If the type of script is Interface, the script will be validated before it is saved. Once the script is saved, the main *Scripts* page is displayed.

To view or update a script:

1. In the Scripts table, select the script and click the **Edit Script** button. The page for editing script attributes displays (see *Figure 8-13*).
2. Update the script **attributes** (see *To add a script:* above).
3. To save, click the **Apply** button.

To rename a script:

1. In the Scripts table, select the script and enter a new script name in the **New Name** field.
2. Click the **Rename Script** button. The script will be renamed and the *Devices > Scripts* page redisplays.

To delete a script:

1. In the Scripts table, select the script to delete.
2. Click the **Delete Script** button. After a confirmation, the script will be deleted and the *Devices > Scripts* page redisplays.

To change the permissions for a script:

1. In the Scripts table, select the script and select the new Group and/or Permissions.
2. Click the **Change Permissions** button. The script updates and the *Devices > Scripts* page redisplays.

To use a script at the CLI:

1. To run an Interface Script on a device port for pattern recognition and action generation, use the `connect script <Script Name> deviceport <Device Port # or Name>` command.
2. To run a Batch Script at the CLI with a series of CLI commands, use the `set script runcli <Script Name>` command.

Batch Script Syntax

The syntax for Batch Scripts is exactly the same as the commands that can be typed at the CLI, with the additions described in this section.

The `sleep` command suspends execution of the script (puts it to 'sleep') for the specified number of seconds. Syntax:

```
sleep <value>
```

The `while` command allows a loop containing CLI commands to be executed. Syntax:

```
while {<Boolean expression>} {
    CLI command 1
    CLI command 2
    ...
    CLI command n
}
```

Note: *The closing left brace '`}`' must be on a line without any other characters. To support a `while` command, the set command, variables, and secondary commands are also supported.*

Interface Script Syntax

This section describes the abbreviated scripting syntax for Interface Scripts. This limited syntax was created to prevent the creation of scripts containing potentially harmful commands. Script commands are divided into three groups: Primary, Secondary and Control Flow. Primary commands provide the basic functionality of a script and are generally the first element on a line of a script, as in:

```
send_user "Password:"
```

Secondary commands provide support for the primary commands and are generally not useful by themselves. For example, the `expr` command can be used to generate a value for a set command.

```
set <my_var> [expr 1 + 1]
```

`Control Flow` commands allow conditional execution of other commands based on the results of the evaluation of a Boolean expression.

Table 8-14 Definitions

Term	Definition
Word	A contiguous group of characters delimited on either side by spaces. Not enclosed by double quotes.
Primary Command	One of the primary commands listed in this section.
Secondary Command	One of the secondary commands defined in this section.
Quoted String	A group of characters enclosed by double quote (") characters. A quoted string may include any characters, including space characters. If a double quote character is to be included in a quoted string it must be preceded (escaped) by a backslash character ('\').
Variable Reference	A word (as defined above) preceded by a dollar sign character ('$').
CLI Command	A quoted string containing a valid CLI `show` command.
Arithmetic Operator	A single character representing a simple arithmetic operation. The character may be one of the following: ◆ A plus sign (+) representing addition ◆ A minus sign (-) representing subtraction ◆ An asterisk sign (*) representing multiplication ◆ A forward slash (/) representing division ◆ A percent sign (%) representing a modulus
Boolean Expression	An expression which evaluates to TRUE or FALSE. A Boolean expression has the following syntax: `<value> <Boolean operator> <value>` Each can be either a word or a variable reference.
Boolean Operator	A binary operator which expresses a comparison between two operands and evaluates to TRUE or FALSE. The following Boolean operators are valid: ◆ '<' less than ◆ '>' greater than ◆ '<=' less than or equal to ◆ '>=' greater than or equal to ◆ '==' equal to ◆ '!=' not equal to

Primary Commands

These are stand-alone commands which provide the primary functionality in a script. These commands may rely on one or more of the Secondary Commands to provide values for some parameters. The preprocessor will require that these commands appear only as the first element of a command line. The start of a command line is delimited by any of the following:

- The start of a new line of text in the script
- A semicolon (';')
- A left brace ('{')

Table 8-15 Primary Commands

Command	Description
set	The set command assigns a value to a variable. Syntax: set <variable> <value> where <variable> is a word, and <value> can be defined in one of the following ways: ◆ A quoted string ◆ A word ◆ A variable reference ◆ A value generated via one of the string secondary commands (compare, match, first, etc.) ◆ A value generated via the expr secondary command ◆ A value generated via the format secondary command ◆ A value generated via the timestamp command
unset	This command removes the definition of a variable within a script. Syntax: unset <variable> where <variable> is a word.
scan	The scan command is analogous to the C language scanf(). Syntax: scan <variable> <format string> <value 1> <value 2> ... <value n> where <variable> is a variable reference, and <format string> is a quoted string. Each of the <value x> elements will be a word.
sleep	The sleep command suspends execution of the script (puts it to 'sleep') for the specified number of seconds. Syntax: sleep <value> where <value> can be a word, a quoted string or a variable reference.
exec	The exec command executes a single CLI command. Currently only CLI 'show' commands may be executed via exec. Syntax: exec <CLI command>
send, send_user	The send command sends output to a sub-process, The send_user command sends output to the standard output. Both commands have the same syntax: send <string> send_user <string> where <string> can be either a quoted string or a variable reference.

Command	Description
expect, expect_user, expect_before, expect_after, expect_background	The expect command waits for input and attempts to match it against one or more patterns. If one of the patterns matches the input the corresponding (optional) command is executed. All expect commands have the same syntax: `expect {<string 1> {command 1} <string 2> {command 2} ... <string n> {command n}}` where `<string x>` will either be a quoted string, a variable reference or the reserved word 'timeout.' The command x is optional, but the curly braces ('{' and '}') are required. If present it must be a primary command.
return	The return command terminates execution of the script and returns an optional value to the calling environment. Syntax: `return <value>` where `<value>` can be a word or a variable reference.

Secondary Commands

These are commands which provide data or other support to the Primary commands. These commands are never used by themselves in a script. The preprocessor will require that these commands always follow a left square bracket ('[') character and be followed on a single line by a right bracket (']').

Table 8-16 Secondary Commands

Command	Description

`string`	The `string` command provides a series of string manipulation operations. The `string` command will only be used with the `set` command to generate a value for a variable. There are nine operations provided by the `string` command. Syntax (varies by operation):
	`string compare <str 1> <str 2>`
	`    Compare two strings`
	`string match <str 1> <str 2>`
	`    Determine if two strings are equal`
	`string first <str needle> <str haystack>`
	`    Find and return the index of the first occurrence of 'str_needle' in 'str_haystack'`
	`string last <str needle> <str haystack>`
	`    Find and return the index of the last occurrence of 'str_needle' in 'str_haystack'`
	`string length <str>`
	`    Return the length of 'str'`
	`string index <str> <int>`
	`    Return the character located at position 'int' in 'str'`
	`string range <str> <int start> <int end>`
	`    Return a string consisting of the characters in 'str' between 'int start' and 'int end'`
	`string tolower <str>`
	`    Convert <str> to lowercase`
	`string toupper <str>`
	`    Convert <str> to uppercase`
	`string trim <str 1> <str 2>`
	`    Trim 'str 2' from 'str 1'`
	`string trimleft <str 1> <str 2>`
	`    Trim 'str 2' from the beginning of 'str 1'`
	`string trimright <str 1> <str 2>`
	`    Trim 'str 2' from the end of 'str 1'`
	In each of the above operations, each <str *> element can either be a quoted string or a variable reference. The <int *> elements will be either words or variable references.

Command	Description
expr	This command evaluates an arithmetic expression and returns the result. The expr command will only be used in combination with the set command to generate a value for a variable. Syntax: `expr <value> <operation> <value>` Each <value> will be either a word or a variable reference, and <operation> an arithmetic operation.
timestamp	This command returns the current time of day as determined by the SLC console manager. The timestamp command will only be used in combination with the set command to produce the value for a variable. Syntax: `timestamp <format>` where <format> is a quoted string.
format	The format command is analogous to the C language sprintf(). The format command will only be used in combination with the set command to produce the value for a variable. Syntax: `format <format string> <value 1> <value 2> ... <value n>` where <format string> will be a quoted string. Each of the <value x> elements will be a word, a quoted string or a variable reference.

Control Flow Commands

The control flow commands allow conditional execution of blocks of other commands. The preprocessor treats these as Primary commands, allowing them to appear anywhere in a script that a Primary command is appropriate.

Table 8-17 Control Flow Commands

Command	Description

while	The while command executes an associated block of commands as long as its Boolean expression evaluates to TRUE. After each iteration the Boolean expression is re-evaluated; when the Boolean expression evaluates to FALSE execution passes to the first command following the associated block. Each command within the block must be a Primary command. Syntax:
	`while {<Boolean expression>} {`
	`    command 1`
	`    command 2`
	`    ...`
	`    command n`
	`}`

Command	Description

`if, elseif and else`	The `if` command executes an associated block of commands if its Boolean expression evaluates to TRUE. Each command within the block must be a Primary command. Syntax:
	`if {<Boolean expression>} {`
	`    command 1`
	`    command 2`
	`    ...`
	`    command n`
	`}`
	The `elseif` command is used in association with an `if` command - it must immediately follow an if or `elseif` command. It executes an associated block of commands if its Boolean expression evaluates to TRUE. Each command within the block must be a Primay command. Syntax:
	`elseif {<Boolean expression>} {`
	`    command 1`
	`    command 2`
	`    ...`
	`    command n`
	`}`
	The `else` command is used in combination with an if or `elseif` command to provide a default path of execution. If the Boolean expressions for all preceding if and `elseif` commands evaluate to FALSE the associated block of commands is executed. Each command within the block must be a primary command. Syntax:
	`else {`
	`    command 1`
	`    command 2`
	`    ...`
	`    command n`
	`}`

Sample Scripts

Interface Script—Monitor Port

The Monitor Port (Monport) script connects directly to a device port by logging into the SLC port, gets the device hostname, loops a couple of times to get port interface statistics, and logs out. The following is the script:

```
set monPort 7
set monTime 5
set sleepTime 2
set prompt ">"
set login "sysadmin"
set pwd "PASS"
#Send CR to echo prompt
send "\r"
sleep $sleepTime
#Log in or check for Command Prompt
```

```
expect {
   #Did not capture "ogin" or Command Prompt
   timeout { send_user "Time out login......\r\n"; return }
   #Got login prompt
   "login" {
      send_user "Logging in....\r\n"
      send "$login\r"
      expect {
         timeout { send_user "Time out waiting for pwd
            prompt......\r\n"; return }
         #Got password prompt
         "password" {
#Send Password
send "$pwd\r"
   expect {
            timeout { send_user "Time out waiting for prompt......\r\n";
               return }
            $prompt {}
            }
      }
   }
   }
   #Already Logged in got Command Prompt
   $prompt {
   send_user "Already Logged....\r\n"
   }
}
#Get hostname info
send "show network port 1 host\r"
expect {
   timeout { send_user "Time out Getting Hostname 1\r\n"; return }
   "Domain" {
      #Get Hostname from SLC
      set hostname "[string range $expect_out(buffer) [string first
         Hostname:
      $expect_out(buffer)] [expr [string first Domain
         $expect_out(buffer)]-2]]"
   }
}
send_user "\r\n\r\n\r\n\r\n"
send_user "Device [string toupper $hostname]\r\n"
send_user
"_________________________________________________________________\r\n"
send_user "Monitored Port: Port $monPort \r\n"
send_user "Monitor Interval Time: $monTime Seconds \r\n"
set loopCtr 0
set loopMax 2
while { $loopCtr < $loopMax } {
   #Get current time
```

The following is the screen output:

```
slb247glenn]> conn script ex4 deviceport 7
login: Logging in....
sysadmin
sysadmin
Password: PASS
Welcome to the Secure Lantronix Console Manager
Model Number: SLC 48
For a list of commands, type 'help'.
[SLC251glenn]> show network port 1 host
show network port 1 host
___Current Hostname
Settings___________________________________________________
Hostname: SLC251glenn
Domain: support.int.lantronix.com
[SLC251glen
Device HOSTNAME: SLC 251GLENN
___________________________________________________________________________
Monitored Port: Port 7
Monitor Interval Time: 5 Seconds
[Current Time:21:16:43]
show portcounter deviceport 7
n]> show portcounter deviceport 7
Device Port: 7 Seconds since zeroed: 1453619
Bytes input: 0 Bytes output: 0
Framing errors: 0 Flow control errors: 0
Overrun errors: 0 Parity errors: 0
[SLC251glenn]>
[Current Time:21:16:58]
show portcounter deviceport 7
show portcounter deviceport 7
Device Port: 7 Seconds since zeroed: 1453634
Bytes input: 0 Bytes output: 0
Framing errors: 0 Flow control errors: 0
Overrun errors: 0 Parity errors: 0
[SLC251glenn]>
Port Counter Monitor Script Ending......
___________________________________________________________________________
Login Out.......
logout
Returning to command line
[slb247glenn]>
```

Batch Script—SLC CLI

This script runs the following SLC CLI commands, then runs the Monport Interface script:

- show network port 1 host
- show deviceport names
- show script
- connect script monport deviceport 7

The following is the screen output of the script:

```
[slb247glenn]> se script runcli cli
[slb247glenn]> show network port 1 host
___Current Hostname
Settings___________________________________________________
Hostname: slb247glenn
Domain: <none>
[slb247glenn]>
[slb247glenn]> show deviceport names
___Current Device Port
Names___________________________________________________
01 - SCS_ALIAS_Test 05 - Port-5
02 - Port-2 06 - Port-6
03 - Port-3 07 - SLC -251
04 - Port-4 08 - Port-8
[slb247glenn]>
[slb247glenn]> show script
___Interface Scripts______Group/
Permissions_____________________________________
getslc Adm/ad,nt,sv,dt,lu,ra,um,dp,pc,rs,fc,dr,sn,wb,sk,po,do
Test Adm/ad,nt,sv,dt,lu,ra,um,dp,pc,rs,fc,dr,sn,wb,sk,po,do
monport Adm/<none>
___Batch Scripts__________Group/
Permissions_____________________________________
cli Adm/ad,nt,sv,dt,lu,ra,um,dp,pc,rs,fc,dr,sn,wb,sk,po,do
[slb247glenn]>
[slb247glenn]> connect script monport deviceport 7
login: Logging in....
sysadmin
sysadmin
Password: PASS
Welcome to the Secure Lantronix Console Manager
Model Number: slc 48
For a list of commands, type 'help'.
[slc251glenn]> show network port 1 host
show network port 1 host
___Current Hostname
Settings___________________________________________________
Hostname: SLC251glenn
Domain: support.int.
Device HOSTNAME: SLC 251GLENN
________________________________________________________________________
Monitored Port: Port 7
Monitor Interval Time: 5 Seconds
[Current Time:21:25:04]
show portcounter deviceport 7
lantronix.com
[slc251glenn]> show portcounter deviceport 7
Device Port: 7 Seconds since zeroed: 1454120
Bytes input: 0 Bytes output: 0
Framing errors: 0 Flow control errors: 0
Overrun errors: 0 Parity errors: 0
[slc251glenn]>
```

```
[Current Time:21:25:20]
show portcounter deviceport 7
show portcounter deviceport 7
Device Port: 7 Seconds since zeroed: 1454136
Bytes input: 0 Bytes output: 0
Framing errors: 0 Flow control errors: 0
Overrun errors: 0 Parity errors: 0
[slc251glenn]>
Port Counter Monitor Script Ending......
```

```
Login Out.......
logout
Returning to command line
[slbvz249_glenn]> show script
___Interface Scripts______Group/
Permissions_____________________________________
test3                     Def/do
___Batch Scripts__________Group/
Permissions_____________________________________
test1                     Adm/
ad,nt,sv,dt,lu,ra,um,dp,ub,rs,fc,dr,sn,wb,sk,po,do
[slbvz249_glenn]>
```

Sites

A site is a group of site-oriented modem parameters that can be activated by various modem-related events (authentication on dial-in, outbound network traffic for a dial-on-demand connection, etc.). The site parameters will override parameters that are configured for a modem.

To use sites with a modem, create one or more sites (described below), then enable **Use Sites** for the modem. Sites can be used with the following modem states: dial-in, dial-back, CBCP Server, dial-on-demand, dial-in & dial-on-demand, and dial-back & dial-on-demand. For more information on how sites are used with each modem state, see *Modem Dialing States on page 136*.

To add a site:

1. Click the **Devices** tab and select the **Sites** option. The Sites page displays:
2. In the lower section of the page, enter the following:

Note: *To clear fields in the lower part of the page, click the **Reset Site** button.*

Site Id (view only)	Displays after a site is created.
Site Name	Enter a name for the site.
Port	Select the device port, UPC card slot, or USB port the site is assigned to. For dial-on-demand sites, a port must be selected. For any other sites, the port selection can be set to **None**. See *Modem Dialing States on page 136*.
Login/CHAP Host	The login name (for PAP authentication) or CHAP host (for CHAP authentication) associated with this site. If a modem has sites enabled and the authentication is successful at dial-in (for modem states dial-in, dial-back, CBCP server, dial-in & dial-on-demand, or dial-back & dial-on-demand), and the name that was authenticated matches the Login/CHAP Host, the site parameters will be used for the remainder of the modem connection.

CHAP Secret	The CHAP secret associated with this site. If a modem has sites enabled and CHAP authentication enabled, then at dial-in, if the remote server sends a name in the CHAP challenge response that matches the CHAP host of a site, the CHAP secret for the site will be used to authenticate the CHAP challenge response sent by the remote server.
Authentication	The type of authentication, **PAP** or **CHAP**, for which this site is applicable. On dial-in authentication, only sites with the authentication type that matches the authentication type configured for the modem will be used to try to find a matching site.
Timeout Logins	For text dial-in connections, the connection can time out after the connection is inactive for a specified number of minutes.
Negotiate IP Address	If the SLC console manager and the remote server should negotiate the IP addresses for each side of the PPP connection, select **Yes**. Select **No** if the address of the SLC unit (**Local IP**) and remote server (**Remote IP**) need to be specified.
Static Route IP Address	The Static Route IP Address, Subnet Mask and Gateway must be configured for dial-on-demand sites. The SLC device will automatically dial-out and establish a PPP connection when IP traffic destined for the network specified by the static route needs to be sent. ***Note:*** *Static Routing must be enabled on the Network - Routing page for dial-on-demand connections.*
Static Route Subnet Mask	The subnet mask for a dial-on-demand connection.
Static Route Gateway	The gateway for a dial-on-demand connection.
Dial-out Number	The dial-out number must be specified for dial-on-demand sites. This indicates the phone number to dial when the SLC console manager needs to send IP traffice for a dial-on-demand connection.
Dial-out Login	User ID for authentication when dialing out to a remote system. May have up to 32 characters. This ID is used for authenticating the SLC unit during the dial-out portion of a dial-back (including CBCP server) and dial-on-demand.
Dial-out Password	Enter the password for authentication when dialing out to a remote system. May have up to 64 characters. This password is used for authenticating the SLC device during the dial-out portion of a dial-back (including CBCP server) and dial-on-demand.
Retype Password	Re-enter the password for authentication when dialing out to a remote system. May have up to 64 characters. This password is used for authenticating the SLC console manager during the dial-out portion of a dial-back (including CBCP server) and dial-on-demand.
Dial-back Number	The phone number to dial on callback for text or PPP dial-back connections. A site must successfully authenticate, have **Allow Dial-back** enabled and have a Dial-back Number defined in order for the site to be used for callback.
Allow Dial-back	If enabled, the site is allowed to be used for dial-back connections.
Dial-back Delay	For dial-back and CBCP Server, the number of seconds between the dial-in and dial-out portions of the dialing sequence.
Dial-back Retries	For dial-back and CBCP Server, the number of times the SLC unit will retry the dial-out portion of the dialing sequence if the first attempt to dial-out fails.
Modem Timeout	Timeout for dial-in and dial-on-demand PPP connections. Select **Yes** (default) for the SLC device to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds. The default is 30 seconds.

Restart Delay	The number of seconds after the modem timeout and before the SLC console manager attempts another connection. The default is 30 seconds.
CBCP Server Allow No Callback	For a CBCP Server site, allows "No Callback" as an option in the CBCP handshake in addition to User-defined Number and Admin-defined Number.
Enable NAT	Select to enable Network Address Translation (NAT) for PPP connections. ***Note:*** *IP forwarding must be enabled on the Network - Settings page for NAT to work.*

3. Click the **Add Site** button.

To view or update a site:

1. In the **Sites** table, select the site and click the **View Site** button. The site attributes are displayed in the bottom half of the page.
2. Update any of the site attributes.
3. Click the **Edit Site** button.

To delete a site:

1. Select the site in the **Sites** table.
2. Click the **Delete Site** button.

Configures a set of site-oriented modem parameters that can be activated by various modem-related events (authentication, outbound network traffic for DOD connections, etc.).

The site parameters will override any parameters configuredfor the modem.

Uses sites with a modem, enable 'usesites'. Sites can be used with the following modem states: dialin, dialback, cbcpserver, dialondemand, dialin+ondemand, and dialback+ondemand.

To create or edit a site:

```
set site add|edit <Site Name> [<parameters>]
```

Parameters:

```
name <Site Name> (edit only)            dialoutnumber <Phone Number>
deviceport <Device Port # or Name or none>  dialoutlogin <User Login>
usbport <U1|U2>                         dialoutpassword <Password>
pccardslot <upper|lower>                allowdialback <enable|disable>
auth <pap|chap>                         dialbacknumber <Phone Number>
loginhost <User Login/CHAP Host>        dialbackdelay <Dial-back Delay>
chapsecret <CHAP Secret>                dialbackretries <1-10>
localipaddr <negotiate|IP Address>      timeoutlogins <disable|1-30
minutes>
remoteipaddr <negotiate|IP Address>     modemtimeout <disable|1-9999 secs>
routeipaddr <IP Address>               routemask <Mask>
restartdelay <PPP Restart Delay>        cbcpnocallback <enable|disable>
routegateway <Gateway>                  nat <enable|disable>
```

To delete a site:

```
set site delete <Site Name>
show site <all|names|Site Name>
```

Modem Dialing States

This section describes how each modem state that supports sites operates when sites are enabled.

Dial In

The SLC console manager waits for a peer to call the SLC unit to establish a text (command line) or PPP connection.

- For text connections, the user will be prompted for a login and password, and will be authenticated via the currently enabled authentication methods (Local Users, NIS, LDAP, etc). The site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on.
  If a matching site is found, the **Timeout Logins** parameter configured for the site will be used for the rest of the dial-in connection instead of the **Timeout Logins** parameter configured for the modem. Once authenticated, a CLI session will be initiated, and the user will remain connected to the SLC console manager until they either logout of the CLI session, or (if **Timeout Logins** is enabled) the CLI session is terminated if it has been idle.
- For PPP connections, the user will be authenticated via PAP or CHAP (determined by the **Authentication** setting for the modem). For PAP, the Local/Remote User list will be used to authenticate the login and password sent by the PPP peer, and the site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on. For CHAP, the site list will be searched for a site that (a) the **Login/CHAP Host** and **CHAP Secret** match the name and secret sent in the CHAP Challenge response by the PPP peer, (b) **Authentication** is set to CHAP, and (c) the **Port** is set to **None** or matches the port the modem is on. If the remote peer requests PAP or CHAP authentication from the SLC unit, the **Remote/Dial-out Login** and **Remote/Dial-out Password** configured for the modem (not the site) will be provided as authentication tokens.
  If a matching site is found, its **Negotiate IP Address**, **NAT**, and **Modem Timeout** parameters will be used for the rest of the dial-in connection instead of the parameters configured for the modem. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting). The PPP connection will stay active until no IP traffic is sent for **Modem Timeout** seconds.

Dial-back

The SLC console manager waits for a peer to call the SLC device, establishes a text (command line) or PPP connection, authenticates the user, and if the SLC unit is able to determine a dial-back number to use, hangs up and calls the dial-back number to establish either a text or PPP connection.

- For text connections, the user will be prompted for a login and password, and will be authenticated via the currently enabled authentication methods (Local Users, NIS, LDAP, etc). The site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on.
  If a matching site is found, its **Timeout Logins**, **Dial-back Number**, **Allow Dial-back**, and **Dial-back Delay** parameters will be used for the rest of the dial-back connection instead of the parameters configured for the modem. Once the remote server is authenticated, if **Allow Dial-back** is enabled for the site and a **Dial-back Number** is defined, the SLC console manager will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC unit will dial, prompt the user again for a login and password, and a CLI session will be initiated.

The user will remain connected to the SLC device until they either logout of the CLI session, or (if **Timeout Logins** is enabled) the CLI session is terminated if it has been idle.

- For PPP connections, the user will be authenticated via PAP or CHAP (determined by the **Authentication** setting for the modem). For PAP, the Local/Remote User list will be used to authenticate the login and password sent by the PPP peer, and the site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on. For CHAP, the site list will be searched for a site that (a) the **Login/CHAP Host** and **CHAP Secret** match the name and secret sent in the CHAP Challenge response by the PPP peer, (b) **Authentication** is set to CHAP, and (c) the **Port** is set to **None** or matches the port the modem is on. If the remote peer requests PAP or CHAP authentication from the SLC console manager, the **Remote/Dial-out Login** and **Remote/Dial-out Password** configured for the modem (not the site) will be provided as authentication tokens.
  If a matching site is found, its **Dial-back Number**, **Allow Dial-back**, **Dial-back Delay**, **Dial-out Login**, **Dial-out Password**, **Negotiate IP Address**, **NAT**, and **Modem Timeout** parameters will be used for the rest of the dial-back connection instead of the parameters configured for the modem. Once the remote server is authenticated, if **Allow Dial-back** is enabled for the site and a **Dial-back Number** is defined, the SLC unit will will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC device will dial, and if the remote peer requests PAP or CHAP authentication, provide the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

Dial-on-demand

The SLC console manager automatically dial outs and establishes a PPP connection when IP traffic destined for a remote network needs to be sent. It will remain connected until no data packets have been sent to the peer for a specified amount of time.

When this modem state is initiated, the SLC unit searches the site list for all sites that (a) have a **Dial-out Number** defined, (b) have a **Static Route IP Address**, **Static Route Subnet Mask** and **Static Route Gateway** defined, and (c) the **Port** matches the port the modem is on. A dial-on-demand connection will be started for each, waiting for IP traffic destined for a remote network. When IP traffic needs to be sent, the SLC device dials the appropriate **Dial-out Number** for the site, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting). The PPP connection will stay active until no IP traffic is sent for **Modem Timeout** seconds. Once the timeout has expired, the PPP connection will be terminated and will not be reestablished for at least **Restart Delay** seconds.

Dial-in & Dial-on-demand

A modem is configured to be in two modes: answering incoming calls to establish a PPP connection, and automatically dialing out to establish a PPP connection when IP traffic destined for a remote network needs to be sent. When either event occurs (an incoming call or IP traffic destined for the remote network), the other mode will be disabled.

- For Dial-in, the user will be authenticated via PAP or CHAP (determined by the **Authentication** setting for the modem). For PAP, the Local/Remote User list will be used to authenticate the login and password sent by the PPP peer, and the site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on. For CHAP, the site list will be searched for a site that (a) the **Login/CHAP Host** and

CHAP Secret match the name and secret sent in the CHAP Challenge response by the PPP peer, (b) **Authentication** is set to CHAP, and (c) the **Port** is set to **None** or matches the port the modem is on. If the remote peer requests PAP or CHAP authentication from the SLC console manager, the **Remote/Dial-out Login** and **Remote/Dial-out Password** configured for the modem (not the site) will be provided as authentication tokens.
If a matching site is found, its **Negotiate IP Address**, **NAT**, and **Modem Timeout** parameters will be used for the rest of the dial-in connection instead of the parameters configured for the modem. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting). The PPP connection will stay active until no IP traffic is sent for **Modem Timeout** seconds.

- For Dial-on-Demand, the SLC unit searches the site list for all sites that (a) have a **Dial-out Number** defined, (b) have a **Static Route IP Address**, **Static Route Subnet Mask** and **Static Route Gateway** defined, and (c) the **Port** matches the port the modem is on. A dial-on-demand connection will be started for each, waiting for IP traffic destined for a remote network. When IP traffic needs to be sent, the SLC device dials the appropriate **Dial-out Number** for the site, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting). The PPP connection will stay active until no IP traffic is sent for **Modem Timeout** seconds. Once the timeout has expired, the PPP connection will be terminated and will not be reestablished for at least **Restart Delay** seconds.

Dial-back & Dial-on-demand

A modem is configured to be in two modes: answering incoming calls to initiate a dial-back, and automatically dialing out to establish a PPP connection when IP traffic destined for a remote network needs to be sent. When either event occurs (an incoming call or IP traffic destined for the remote network), the other mode will be disabled.

- For Dial-back, the user will be authenticated via PAP or CHAP (determined by the **Authentication** setting for the modem). For PAP, the Local/Remote User list will be used to authenticate the login and password sent by the PPP peer, and the site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on. For CHAP, the site list will be searched for a site that (a) the **Login/CHAP Host** and **CHAP Secret** match the name and secret sent in the CHAP Challenge response by the PPP peer, (b) **Authentication** is set to CHAP, and (c) the **Port** is set to **None** or matches the port the modem is on. If the remote peer requests PAP or CHAP authentication from the SLC console manager, the **Remote/Dial-out Login** and **Remote/Dial-out Password** configured for the modem (not the site) will be provided as authentication tokens.
  If a matching site is found, its **Dial-back Number**, **Allow Dial-back**, **Dial-back Delay**, **Dial-out Login**, **Dial-out Password**, **Negotiate IP Address**, **NAT**, and **Modem Timeout** parameters will be used for the rest of the dial-back connection instead of the parameters configured for the modem. Once the remote server is authenticated, if **Allow Dial-back** is enabled for the site and a **Dial-back Number** is defined, the SLC unit will will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC device will dial, and if the remote peer requests PAP or CHAP authentication, provide the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).
- For Dial-on-Demand, the SLC console manager searches the site list for all sites that (a) have a **Dial-out Number** defined, (b) have a **Static Route IP Address**, **Static Route Subnet Mask** and **Static Route Gateway** defined, and (c) the **Port** matches the port the modem is on. A

dial-on-demand connection will be started for each, waiting for IP traffic destined for a remote network.
When IP traffic needs to be sent, the SLC unit dials the appropriate **Dial-out Number** for the site, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting). The PPP connection will stay active until no IP traffic is sent for **Modem Timeout** seconds. Once the timeout has expired, the PPP connection will be terminated and will not be reestablished for at least **Restart Delay** seconds.

CBCP Server

Callback Control Protocl (CBCP) is a PPP option that negotiates the use of callback where the server, after authenticating the client, terminates the connection and calls the client back at a phone number that is determined by the CBCP handshake. For more information on CBCP, see http://technet.microsoft.com/en-us/library/cc957979.aspx. CBCP is used primarily by Microsoft PPP peers. CBCP supports two options for determining the number to dial on callback: the client can specify a user-defined number for the server to dial on callback, or the client can request the server use an administrator-defined number to dial on callback. Optionally, some servers may also allow "no callback" as an option.

For CBCP Server, the SLC console manager waits for a client to call the unit, establishes a PPP connection, authenticates the user, and negotiates a dial-back number with the client using CBCP. If the SLC unit is able to determine a dial-back number to use, it hangs up and calls the dial-back number.

When a call is received, a PPP connection is established, and the user will be authenticated via PAP or CHAP (determined by the **Authentication** setting for the modem). For PAP, the Local/Remote User list will be used to authenticate the login and password sent by the PPP peer, and the site list will be searched for a site that (a) the **Login/CHAP Host** matches the name that was authenticated, (b) **Authentication** is set to PAP, and (c) the **Port** is set to **None** or matches the port the modem is on. For CHAP, the site list will be searched for a site that (a) the **Login/CHAP Host** and **CHAP Secret** match the name and secret sent in the CHAP Challenge response by the PPP peer, (b) **Authentication** is set to CHAP, and (c) the **Port** is set to **None** or matches the port the modem is on. If the remote peer requests PAP or CHAP authentication from the SLC console manager the **Remote/Dial-out Login** and **Remote/Dial-out Password** configured for the modem (not the site) will be provided as authentication tokens.

If a matching site is found, its **CBCP Server Allow No Callback**, **Dial-back Number**, **Allow Dial-back**, **Dial-back Delay**, **Dial-out Login**, **Dial-out Password**, **Negotiate IP Address**, **NAT**, and **Modem Timeout** parameters will be used for the rest of the dial-back connection instead of the parameters configured for the modem. Once the remote server is authenticated, the CBCP handshake with the client determines the number to use for dial-back. The SLC unit will present the client with the available options: if **Allow Dial-back** is enabled for the site and a **Dial-back Number** is defined, the administrator-defined option is allowed; if this is not the case, the user-defined number is allowed. Additionally, if **CBCP Server Allow No Callback** is enabled, the client can also select no callback (the PPP connection established at dial-in will remain up). The client will select from the available callback options. If the SLC device can determine a dial-back number to use, it will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC console manager will call back the previously authenticated remote peer, and if the remote peer requests PAP or CHAP authentication, provide the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

9: PC Cards

This chapter describes how to configure storage by using the PC Card web page and CLI. The PC Card page can be used to configure Compact Flash storage and modem/ISDN PC cards. A Compact Flash is useful for saving and restoring configurations and for Device Port Logging (see *Device Ports – Logging on page 96*).

The SLC console manager supports a variety of Compact Flash-to-PC Card adapters, as well as modem and Basic Rate Interface (BRI) ISDN cards. See the Lantronix web site www.lantronix.com/products/pc-cards-slc.html for a complete list.

This chapter contains the following sections:

- *Set Up of PC Card Storage*
- *Modem Settings*
- *PC Card Commands*

Note: *This PC Cards chapter applies only to SLC -02 part numbers.*

Set Up of PC Card Storage

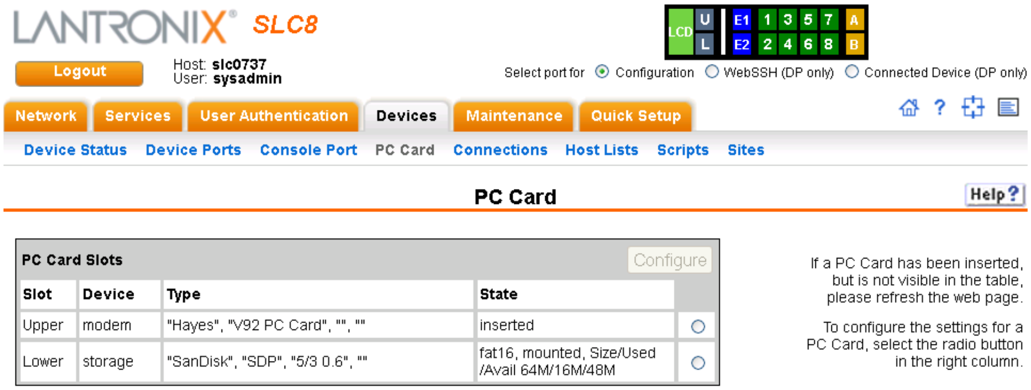
To set up PC Card storage in the SLC console manager, perform the following steps.

1. Insert any of the supported PC cards into either of the PC card bays on the front of the SLC device. You can do this before or after powering up the SLC console manager.

   If the card is a compact Flash-to-PC card adapter, and the first partition on the compact flash is formatted with a file system supported by the SLC device (ext2 and FAT), the card mounts automatically.

2. If the card does not mount automatically, or if you want to update its settings, click the **Devices** tab and select the **PC Card** option. *Figure 9-1* shows the page that displays.

Figure 9-1 PC Card Page



Host: **slc0737**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

PC Card

PC Card Slots

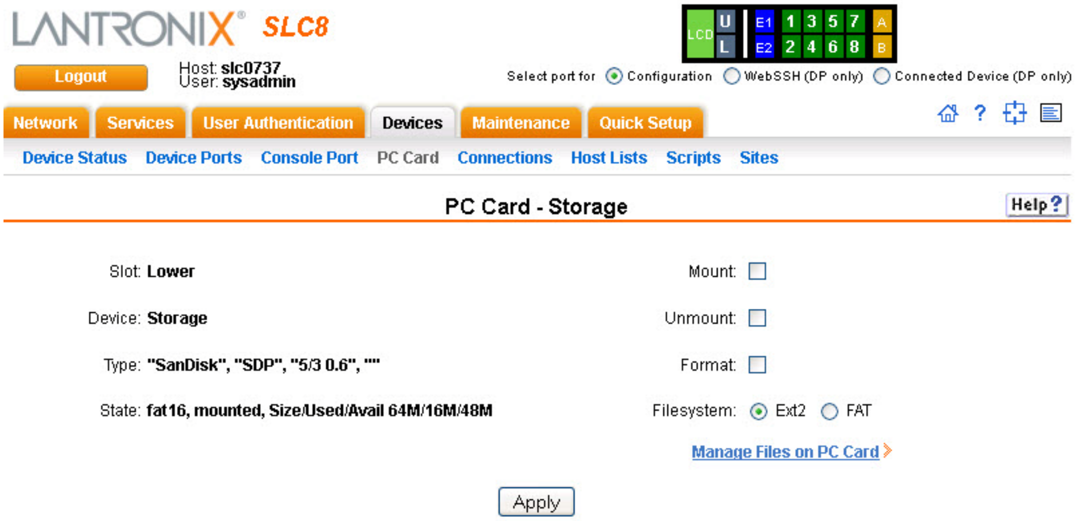
Slot	Device	Type	State	
Upper	modem	"Hayes", "V92 PC Card", "", ""	inserted	○
Lower	storage	"SanDisk", "SDP", "5/3 0.6", ""	fat16, mounted, Size/Used /Avail 64M/16M/48M	○

If a PC Card has been inserted, but is not visible in the table, please refresh the web page.

To configure the settings for a PC Card, select the radio button in the right column.

3. From the **PC Card Slots** table, click the button (on the right) for the PC card you want to configure for storage and click the **Configure** button. *Figure 9-2* shows the page that displays.

Figure 9-2 PC Card - Storage Page



Slot: **Lower**

Device: **Storage**

Type: **"SanDisk", "SDP", "5/3 0.6", ""**

State: **fat16, mounted, Size/Used/Avail 64M/16M/48M**

Mount: □

Unmount: □

Format: □

Filesystem: ● Ext2 ○ FAT

4. Enter the following fields.

Slot (view only)	Slot on the SLC console manager where the PC Card is inserted.
Device (view only)	Type of PC Card (modem or storage).
Type (view only)	Information read from PC Card.
State (view only)	Applies to storage cards.
Mount	Click the checkbox to mount the first partition of the Compact Flash on the SLC device (if not currently mounted). Once mounted, a Compact Flash is used for device port logging and saving/restoring configurations.
Unmount	Click the checkbox to eject the compact flash from the SLC console manager after unmounting it. ***Warning: If you eject a Compact Flash from the SLC device without unmounting it, subsequent mounts of a PC Card Compact Flash in either slot may fail, and you will need to reboot the SLC console manager to restore PC Card functionality.***
Format	Select to unmount the Compact Flash (if it is mounted), remove all existing partitions, create one partition on the Compact Flash, format it with the selected file system (ext2 or FAT), and mount it.
Filesystem	Select **ext2** or **FAT**, the file systems the SLC console manager supports.

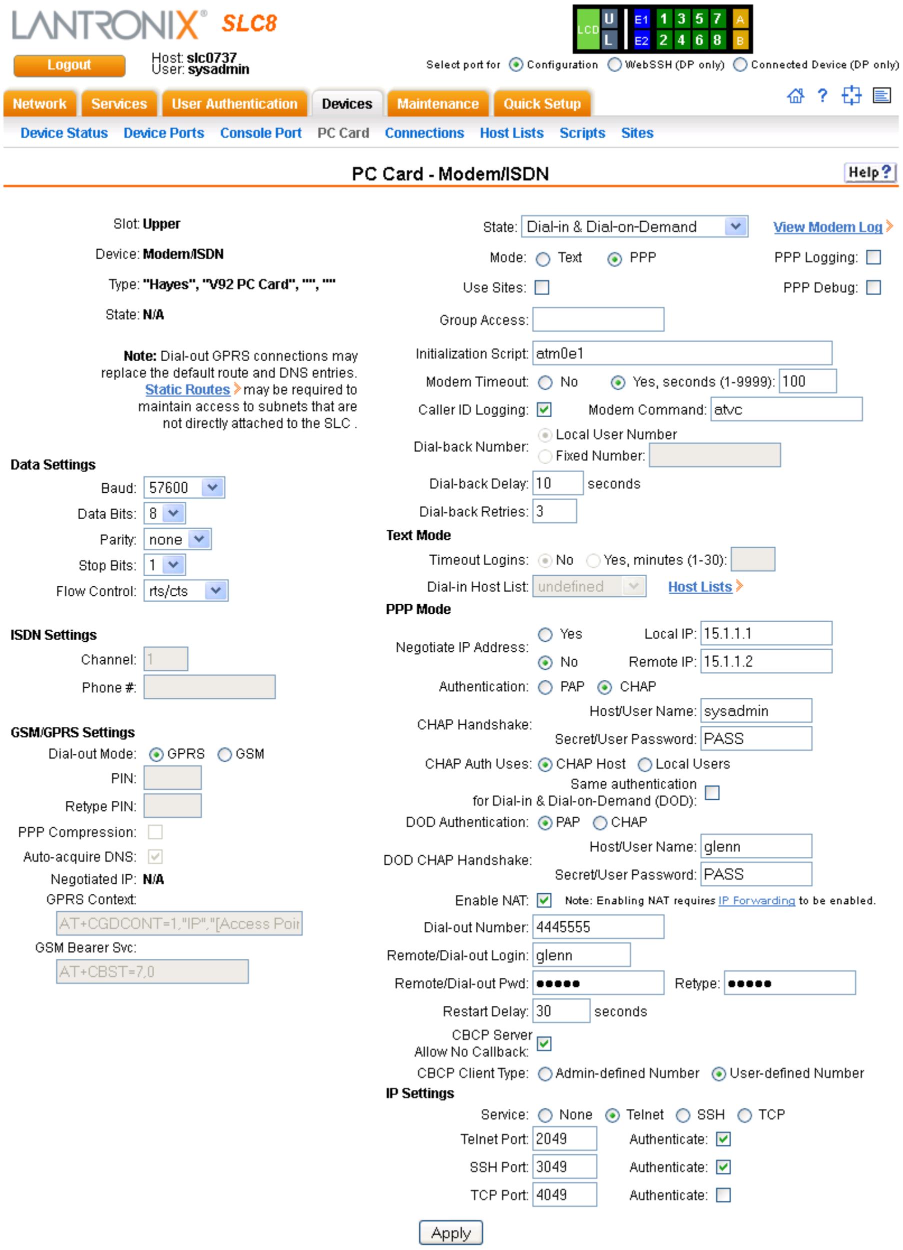
5. Click the **Apply** button.

Modem Settings

To enter modem settings for a PC card, perform the following steps.

1. Insert any of the supported modem or ISDN cards (see www.lantronix.com/slc) into one of the PC card bays on the front of the SLC device. You can do this before or after powering up the SLC console manager.
2. Click the **Devices** tab and select the **PC Card** option.
3. Click the radio button in the PC Card Slots table that shows a modem installed.
4. Click the **Configure** button. *Figure 9-3* shows the page that displays.

Figure 9-3 PC Card - Modem/ISDN Page


LANTRONIX® SLC8
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Logout
Network | Services | User Authentication | Devices | Maintenance | Quick Setup
Device Status | Device Ports | Console Port | PC Card | Connections | Host Lists | Scripts | Sites
Help ?
View Modem Log
Host Lists
Apply

Host: **slc0737**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

PC Card - Modem/ISDN

Slot: **Upper**

Device: **Modem/ISDN**

Type: **"Hayes", "V92 PC Card", "", ""**

State: **N/A**

Note: Dial-out GPRS connections may replace the default route and DNS entries. Static Routes may be required to maintain access to subnets that are not directly attached to the SLC .

Data Settings

Baud: 57600
Data Bits: 8
Parity: none
Stop Bits: 1
Flow Control: rts/cts

ISDN Settings

Channel: 1
Phone #:

GSM/GPRS Settings

Dial-out Mode: ● GPRS ○ GSM
PIN:
Retype PIN:
PPP Compression: □
Auto-acquire DNS: ☑
Negotiated IP: **N/A**
GPRS Context: AT+CGDCONT=1,"IP","[Access Poir
GSM Bearer Svc: AT+CBST=7,0

State: Dial-in & Dial-on-Demand

Mode: ○ Text ● PPP
PPP Logging: □
Use Sites: □
PPP Debug: □
Group Access:
Initialization Script: atm0e1
Modem Timeout: ○ No ● Yes, seconds (1-9999): 100
Caller ID Logging: ☑ Modem Command: atvc
Dial-back Number: ● Local User Number ○ Fixed Number:
Dial-back Delay: 10 seconds
Dial-back Retries: 3

Text Mode

Timeout Logins: ● No ○ Yes, minutes (1-30):
Dial-in Host List: undefined

PPP Mode

Negotiate IP Address: ○ Yes ● No
Local IP: 15.1.1.1
Remote IP: 15.1.1.2
Authentication: ○ PAP ● CHAP
CHAP Handshake: Host/User Name: sysadmin
Secret/User Password: PASS
CHAP Auth Uses: ● CHAP Host ○ Local Users
Same authentication for Dial-in & Dial-on-Demand (DOD): □
DOD Authentication: ● PAP ○ CHAP
DOD CHAP Handshake: Host/User Name: glenn
Secret/User Password: PASS
Enable NAT: ☑ Note: Enabling NAT requires IP Forwarding to be enabled.
Dial-out Number: 4445555
Remote/Dial-out Login: glenn
Remote/Dial-out Pwd: ●●●●● Retype: ●●●●●
Restart Delay: 30 seconds
CBCP Server Allow No Callback: ☑
CBCP Client Type: ○ Admin-defined Number ● User-defined Number

IP Settings

Service: ○ None ● Telnet ○ SSH ○ TCP
Telnet Port: 2049 Authenticate: ☑
SSH Port: 3049 Authenticate: ☑
TCP Port: 4049 Authenticate: □

5. Enter the following fields.

Slot (view only)	Displays the slot position.
Device (view only)	Displays the device type.
Type (view only)	Displays the card type.
State (view only)	Displays the state of the device.
State	Enables the modem to use dial-out, dial-in, dial-back, CBCP server, CBCP client, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, or dial-in/ host list. Disabled by default. For more information on the different dialing types, see *Modem State Parameters on page 329*.
Mode	Enables the format in which the data flows back and forth. With Text selected, the SLC console manager assumes that the modem will be used for remotely logging into the command line. Text mode is only for dialing in. This is the default. PPP establishes an IP-based link over the modem. PPP connections can be used in dial-out mode (e.g., the SLC device connects to an external network) or dial-in mode (e.g., the external computer connects to the network that the SLC console manager is part of), dial-back (dial-in followed by dial-out), CBCP server and CBCP client. For ISDN cards, only PPP connections are allowed.
PPP Logging	Check checkbox to turn on PPP logging.
PPP Debug	Check checkbox to include debugger information in the PPP log.
Use Sites	Enables the use of site-oriented modem parameters which can be activated by various modem-related events (authentication, outbound network traffic for dial-on-demand connections, etc.). Sites can be used with the following modem states: dial-in, dial-back, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, and CBCP server. For more information see *Sites on page 133*.
Group Access	If undefined, any group can access the modem (text login only). If one or more groups are specified (groups are delimited by the characters ',' (comma) or ';' (semicolon)), then any user who logs into the modem must be a member of one of the specified groups, otherwise access will be denied. Users authenticated via RADIUS may have a group (or groups) provided by the RADIUS server via the Filter-Id attribute that overrides the group defined for a user on the SLC or SLB unit. A group provided by a remote server must be either a single group or multiple groups delimited by the characters ',' (comma), ';' (semicolon), or '=' (equals) - for example "group=group1,group2;" or "group1,group2,group3".
Initialization Script	Sends commands to the modem. You can configure the modem to have up to 100 characters. Consult your modem documentation for recommended initialization options. If you do not specify an initialization script, the SLC device uses a uses a default initialization string of AT S7=45 SO=0 L1 V1 X4 &D2 &c1 E1 Q0. ***Note:*** *We recommend that the modem initialization script always be prepended with AT and include E1 V1 x4 Q0 so that the SLC console manager may properly control the modem.*
Modem Timeout	Timeout for modem connections. Select Yes (default) for the SLC device to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds.
Caller ID Logging	Select to enable the SLC console manager to log caller IDs on incoming calls. Disabled by default. ***Note:*** *For the Caller ID AT command, refer to your Modem User Guide.*

Modem Command	Modem AT command used to initiate caller ID logging by the modem. ***Note:*** *For the AT command, refer to your Modem User Guide.*
Dial-back Number	Users with dial-back access can dial into the SLC device and enter their login and password. Once the SLC console manager authenticates them, the modem hangs up and dials them back. Select the phone number the modem dials back on--a fixed number or a number associated with their login. If you select Fixed **Number**, enter the number (in the format 2123456789).
Dial-back Delay	For dial-back and CBCP Server, the number of seconds between the dial-in and dial-out portions of the dialing sequence. For more information about CBCP, see *Modem State Parameters on page 329*.
Dial-back Retries	For dial-back and CBCP Server, the number of times the SLC or SLB unit will retry the dial-out portion of the dialing sequence if the first attempt to dial-out fails.

Data Settings

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use **9600** for the administration port, so this is the default. Check the equipment settings and documentation for the proper baud rate.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Stop Bits	The number of stop bit(s) used to indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.

ISDN Settings

Note: *These fields are disabled if the PC Card inserted is not an ISDN card.*

Channel	Select to indicate which B channel on the ISDN card to use. Valid values are 1 and 2. (The B-channel is the channel that carries the main data.) Only one 64K channel can be used at a time.
Phone #	Phone number associated with the B channel. May have up to 20 characters. Any format is acceptable.

GSM/GPRS Settings

These settings are only active when a GSM/GPRS PC card modem is in the appropriate slot.

Notes:

- *Please consult your wireless carrier configuration requirements for more detailed information.*

- *Dial-out GPRS connections may replace the default route and DNS entries. Static routes may be required to maintain access to subnets that are not directly attached to the SLC console manager. Click the **Static Routes** link (above **Data Settings)** to configure a static route. (See Routing on page 58.)*

Dial-out Mode	Select the type of dial-out connection: ◆ **GPRS:** (General Packet Radio Service) ◆ **GSM:** (Global System for Mobile communication)
PIN / Retype PIN	PIN (personal identification number) for accessing the GSM/GPRS card.
PPP Compression	Select to enable negotiation of data compression over PPP links. Disabled by default.
Auto-acquire DNS	Select to enable the SLC console manager to acquire up to three DNS servers by means of GPRS. Enabled by default.
Negotiated IP (view only)	IP address associated with the GPRS connection.
GPRS Context	Command to specify the protocol data packet (PDP) context parameter values.
GSM Bearer Svc.	Command to select the bearer service, data rate, and connection element to use when data call originate.

Text Mode

Timeout Logins	If you selected **Text** mode, you can enable logins to time out after the connection is inactive for a specified number of minutes. The default is **No**. This setting only applies to text mode connections. **PPP** mode connections stay connected until either side drops the connection. Disabled by default.
Dial-in Host List	From the drop-down list, select the desired host list. The host list is a prioritized list of SSH, Telnet and TCP hosts that are available for establishing outgoing modem connections. The hosts in the list are cycled through until the modem successfully connects to one. To establish and configure host lists, click the **Host Lists** link. See *Hostname & Name Servers on page 52.*

PPP Mode

Negotiate IP Address	If the SLC device and/or the serial device have dynamic IP addresses (e.g., IP addresses assigned by a DHCP server), select **Yes**. This is the default. If the SLC console manager or the modem have fixed IP addresses, select **No,** and enter the **Local IP** (IP address of the port) and **Remote IP** (IP address of the modem).
Authentication	Enables **PAP** or **CHAP** authentication for modem logins. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the **CHAP Handshake** fields authenticate the user.
CHAP Handshake	The **Host/Username** (for UNIX systems) or **Secret/User Password** (for Windows systems) used for CHAP authentication. May have up to 128 characters.

CHAP Auth Uses	Select the method of CHAP Authorization: ◆ Through the CHAP Host user name and password established under CHAP Handshake. ◆ Through the username and password established under Local/Remote User database.
Same authentication for Dial-in & Dial-on-Demand (DOD)	Select this option to let incoming connections (dial-in) use the same authentication settings as outgoing connections (dial-on-demand). If this option is not selected, then the dial-on-demand connections take their authentication settings from the DOD parameter settings. If **DOD Authentication** is PAP, then the **DOD CHAP Handshake** field is not used.
DOD Authentication	Enables **PAP** or **CHAP** authentication for dial-in & dial-on-demand. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the **DOD CHAP Handshake** fields authenticate the user.
DOD CHAP Handshake	For **DOD Authentication**, enter the host/username for UNIX systems) or secret/ user password (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Enable NAT	Select to enable Network Address Translation (NAT) for dial-in and dial-out PPP connections on a per modem (Device Port or PC Card) basis. Users dialing into the SLC console manager access the network connected to Eth1 and/or Eth2. *Note: IP forwarding must be enabled on the Network - Settings page for NAT to work. To enable, click the **IP Forwarding** link to display the Network Settings page.*
Dial-out Number	Phone number for dialing out to a remote system or serial device. May have up to 20 characters. Any format is acceptable.
Remote/Dial-out Login	User ID for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC or SLB device when it dials in. May have up to 32 characters.
Remote/Dial-out Pwd and Retype	Password for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC or SLB unit when it dials in. May have up to 64 characters.
Restart Delay	The number of seconds after the timeout and before the SLC console manager attempts another connection. The default is **30** seconds.
CBCP Server Allow No Callback	For CBCP Server state, allows “No Callback” as an option in the CBCP handshake in addition to User-defined Number and Admin-defined Number. For more information about CBCP, see *Modem State Parameters on page 329.*
CBCP Client Type	For CBCP Client, this selects the number that the client would like to use for callback - either a user-defined number passed to the server (specified by the Fixed Dial-back Number) or an administrator-defined number determined by the server based on the login that is PAP or CHAP authenticated. For more information about CBCP, see *Modem State Parameters on page 329*.

IP Settings

Service	The available connection services for the modem port. Check Telnet, SSH, or TCP to enable. Only one can be active at a time. The default is **None**.

Telnet Port	Telnet session port number to use if you selected **Telnet**. Defaults: ◆ Upper PC Card Slot: **2049** ◆ Lower PC Card Slot: **2050** ◆ Range: **1025-65535** ◆ **Authenticate**: Checkbox and if selected, the SLC console manager requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet Port** and **SSH Port,** but not for **TCP Port**.
SSH Port	The SSH session port number to use if you selected **SSH**. Defaults: ◆ Upper PC Card Slot: **3049** ◆ Lower PC Card Slot: **3050** ◆ Range: **1025-65535** ◆ **Authenticate**: Checkbox and if selected, the SLC device requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet Port** and **SSH Port,** but not for **TCP Port**.
TCP Port	The TCP (raw) session port number to use if you selected **TCP**. Defaults: ◆ Upper PC Card Slot: **4049** ◆ Lower PC Card Slot: **4050** ◆ Range: **1025-65535** ◆ **Authenticate**: Checkbox and if selected, the SLC console manager requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet Port** and **SSH Port,** but not for **TCP Port**.

6. Click the **Apply** button.

To view the log of all modem activity:

1. Click the **View Modem Log** link.

PC Card Commands

The following CLI commands correspond to the PC Card. For more information, see *Chapter 15: Command Reference* .

- *pccard storage copy (on page 296)*
- *pccard storage delete (on page 296)*
- *pccard storage dir (on page 296)*
- *pccard storage format (on page 296)*
- *pccard storage mount (on page 296)*
- *pccard storage rename (on page 297)*
- *pccard storage unmount (on page 297)*
- *show pccard storage (on page 297)*
- *pccard modem (on page 294)*
- *show pccard modem (on page 297)*
- *show pccard (on page 297)*
- *set log clear modem (on page 287)*
- *set log modem pppdebug (on page 288)*
- *show log modem (on page 288)*

10: USB Port

This chapter describes how to configure storage by using the *Devices > USB* page and CLI. This page can be used to configure the thumb drive and modems. The thumb drive is useful for saving and restoring configurations and for Device Port Logging. See *Device Port Settings (on page 96)*.

This chapter describes the Web Manager pages and available CLI commands that configure the SLC console manager USB. For information about quick setup, installation, services, device ports, connections, user authentication, and maintenance tasks, see those chapters. This chapter contains the following sections:

- Set Up of USB Storage
- Manage Firmware and Configuration Files

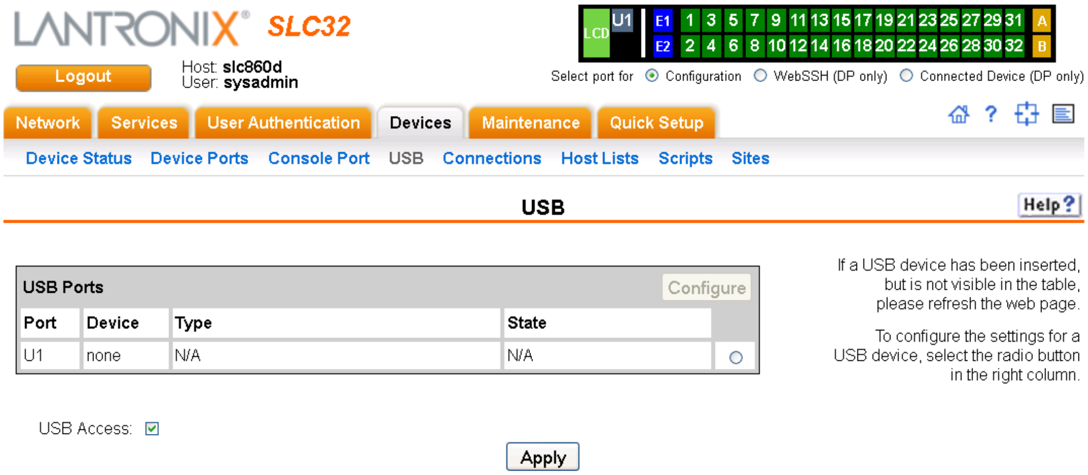
Set Up of USB Storage

The *Devices > USB* page has an USB Access checkbox. USB Access is a security feature ensures that access to any USB device is disabled if the box is unchecked. The SLC unit ignores any USB device plugged into the port.

To set up USB storage in the SLC console manager perform the following steps.

1. Insert any of the supported thumb drives into the USB port on the front of the SLC unit. You can do this before or after powering up the SLC device.
2. Log into the SLC console manager and click **Devices**.
3. Click **USB**. *Figure 10-1* shows the page that displays. Your USB device should display in if you have inserted it. If is does not display and you have inserted it, refresh the web page.

Figure 10-1 Devices > USB



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

USB

USB Ports

Port	Device	Type	State	
U1	none	N/A	N/A	○

If a USB device has been inserted, but is not visible in the table, please refresh the web page.

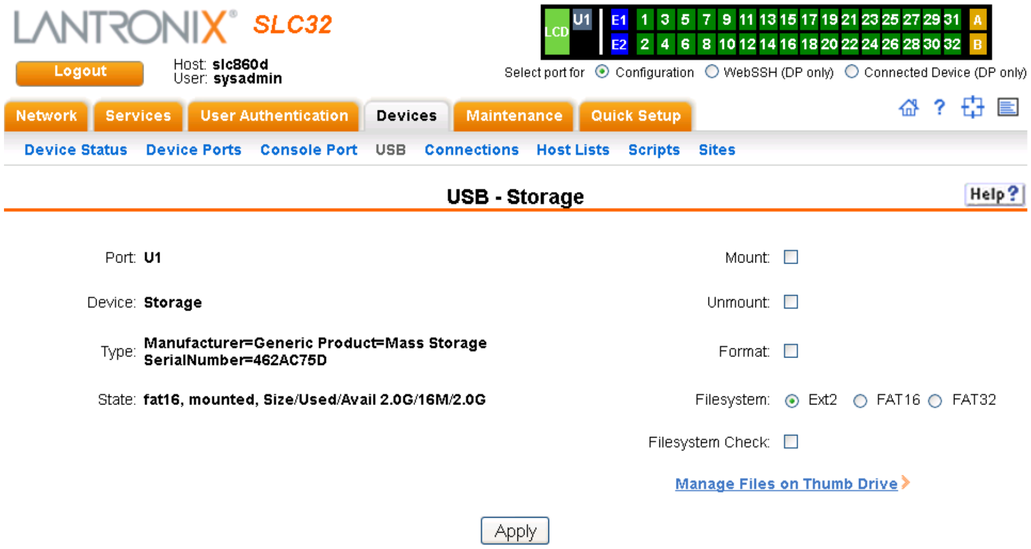
To configure the settings for a USB device, select the radio button in the right column.

USB Access: ☑

To configure the USB port, from the USB Ports table,

1. Click the radio button (on the far right) for Port U1.
2. Click **Configure**. *Figure 10-2* shows the page that displays if a USB storage device is inserted in Port U1.

Figure 10-2 Devices > USB > Configure



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

USB - Storage

Port: U1

Device: Storage

Type: Manufacturer=Generic Product=Mass Storage SerialNumber=462AC75D

State: fat16, mounted, Size/Used/Avail 2.0G/16M/2.0G

Mount: □

Unmount: □

Format: □

Filesystem: ● Ext2 ○ FAT16 ○ FAT32

Filesystem Check: □

3. Enter the following fields.

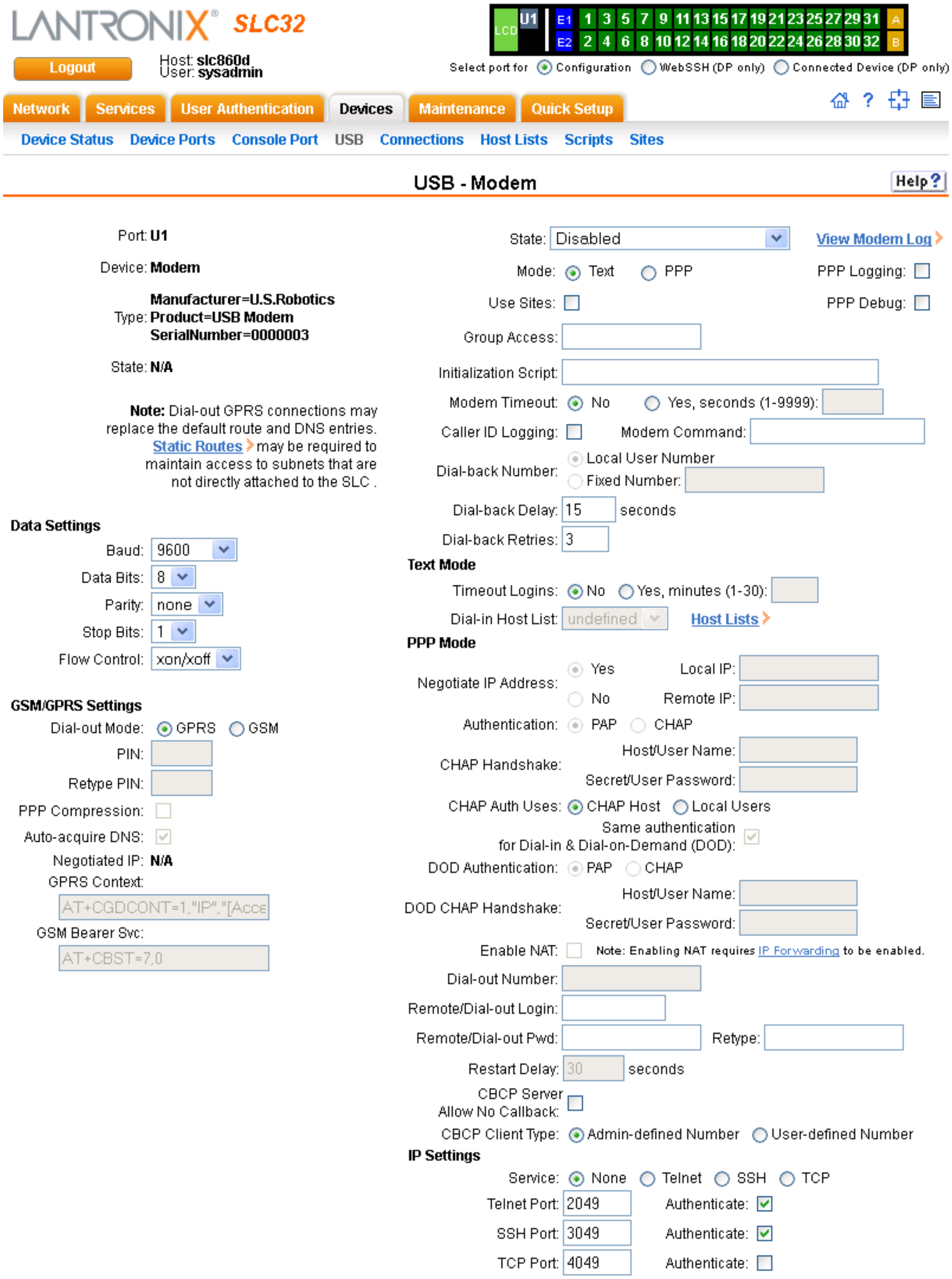
Mount	Enables the first partition of the USB device (if not currently mounted). Once mounted, a device is used for device port logging and saving/restoring configurations.
Unmount	Enables ejecting the USB device. ***Warning:*** ***If you eject a USB device from the SLC console manager without unmounting it, subsequent mounts may fail, and you will need to reboot the SLC unit to restore the functionality.***
Format	Select to: ◆ Unmount the USB device (if it is mounted) ◆ Remove all existing partitions ◆ Create one partition ◆ Format it with the selected file system (ext2, FAT16 or FAT32) ◆ Mount the USB device
Filesystem	Select **Ext2, FAT16** or **FAT32**, the file systems the SLC unit supports.
Filesystem Check	Select to run a filesystem integrity check on the thumb drive. This is recommended if the filesystem does not mount or if the filesystem has errors.

4. Click **Apply**.

To configure the USB Modem port, from the Modem USB Ports table:

1. Click the radio button (on the far right) for Port U1 or U2.
2. Click **Configure**. *Figure 10-3* shows the page that displays if a USB modem is inserted in Port U1, or if Port U2 is selected.

Figure 10-3 Devices > USB > Modem


LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help ?

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

USB - Modem

Port: **U1**

Device: **Modem**

Type: **Manufacturer=U.S.Robotics**
Product=USB Modem
SerialNumber=0000003

State: **N/A**

Note: Dial-out GPRS connections may replace the default route and DNS entries. Static Routes may be required to maintain access to subnets that are not directly attached to the SLC .

Data Settings

Baud: 9600
Data Bits: 8
Parity: none
Stop Bits: 1
Flow Control: xon/xoff

GSM/GPRS Settings

Dial-out Mode: ● GPRS ○ GSM
PIN:
Retype PIN:
PPP Compression: □
Auto-acquire DNS: ☑
Negotiated IP: **N/A**
GPRS Context: AT+CGDCONT=1,"IP","[Acce
GSM Bearer Svc: AT+CBST=7,0

State: Disabled View Modem Log
Mode: ● Text ○ PPP PPP Logging: □
Use Sites: □ PPP Debug: □
Group Access:
Initialization Script:
Modem Timeout: ● No ○ Yes, seconds (1-9999):
Caller ID Logging: □ Modem Command:
Dial-back Number: ● Local User Number ○ Fixed Number:
Dial-back Delay: 15 seconds
Dial-back Retries: 3

Text Mode

Timeout Logins: ● No ○ Yes, minutes (1-30):
Dial-in Host List: undefined Host Lists

PPP Mode

Negotiate IP Address: ● Yes Local IP:
○ No Remote IP:
Authentication: ● PAP ○ CHAP
CHAP Handshake: Host/User Name:
Secret/User Password:
CHAP Auth Uses: ● CHAP Host ○ Local Users
Same authentication for Dial-in & Dial-on-Demand (DOD): ☑
DOD Authentication: ● PAP ○ CHAP
DOD CHAP Handshake: Host/User Name:
Secret/User Password:
Enable NAT: □ Note: Enabling NAT requires IP Forwarding to be enabled.
Dial-out Number:
Remote/Dial-out Login:
Remote/Dial-out Pwd: Retype:
Restart Delay: 30 seconds
CBCP Server Allow No Callback: □
CBCP Client Type: ● Admin-defined Number ○ User-defined Number

IP Settings

Service: ● None ○ Telnet ○ SSH ○ TCP
Telnet Port: 2049 Authenticate: ☑
SSH Port: 3049 Authenticate: ☑
TCP Port: 4049 Authenticate: □

3. Enter the following fields.

Data Settings

Note: *Check the modem's equipment settings and documentation for the proper settings. The attached modem must have the same settings.*

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use **9600** for the administration port, so the device port defaults to this value. Check the equipment settings and documentation for the proper baud rate.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Stop Bits	The number of stop bit(s) used to indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include **none, xon/xoff (**software), and **RTS/CTS** (hardware). The default is **none**.

GSM/GPRS Settings

Dial-out Mode	Select either GPRS or GSM (Global System for Mobile communication) as the type of dial-out connection.
PIN	Enter PIN (personal identification number) for accessing the GSM/GPRS card.
Retype PIN	Re-enter PIN (personal identification number) for accessing the GSM/GPRS card.
PPP Compression	Select to enable negotiation of data compression over PPP links. Disabled by default.
Auto-acquire DNS	Select to enable the SLC console manager to acquire up to three DNS servers by means of GPRS (General Packet Radio Service). Enabled by default.
Negotiated IP	IP address associated with the GPRS connection.
GPRS Context	Command to specify the protocol data packet (PDP) context parameter values.
GSM Bearer Svc	Command to select the bearer service, data rate, and connection element to use when data call originate.

Modem Settings

Note: *Depending on the **State** and **Mode** you select, different fields are available.*

State	If enabling, set the modem to dial-out, dial-in, dial-back, CBCP server, CBCP client, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, or dial-in/host list. Disabled by default. For more information on the different dialing types, see *Modem Dialing States (on page 136)*.
Mode	The format in which the data flows back and forth: ◆ **Text:** In this mode, the SLC console manager assumes that the modem will be used for remotely logging into the command line. Text mode can only be used for dialing in or dialing back. **Text** is the default. ◆ **PPP:** This mode establishes an IP-based link over the modem. PPP connections can be used in dial-out mode (e.g., the SLC unit connects to an external network), dial-in mode (e.g., the external computer connects to the network that the SLC device is part of), or dial-on-demand.

Use Sites	Enables the use of site-oriented modem parameters which can be activated by various modem-related events (authentication, outbound network traffic for dial-on-demand connections, etc.). Sites can be used with the following modem states: dial-in, dial-back, dial-on-demand, dial-in & dial-on-demand, dial-back & dial-on-demand, and CBCP server.
Group Access	If undefined, any group can access the modem (text login only). If one or more groups are specified (groups are delimited by the characters ' ' (space), ',' (comma), or ';' (semicolon)), then any user who logs into the modem must be a member of one of the specified groups, otherwise access will be denied. Users authenticated via RADIUS may have a group (or groups) provided by the RADIUS server via the Filter-Id attribute that overrides the group defined for a user on the SLC console manager. A group provided by a remote server must be either a single group or multiple groups delimited by the characters ' ' (space), ',' (comma), ';' (semicolon), or '=' (equals) - for example "group=group1,group2;" or "group1,group2,group3".
Initialization Script	Commands sent to configure the modem may have up to 100 characters. Consult your modem's documentation for recommended initialization options. If you do not specify an initialization script, the SLC unit uses a default initialization string of `AT S7=45  SO=0  L1  V1  X4  &D2  &c1  E1  Q0`. ***Note:*** *We recommend that the modem initialization script always be preceded with* `AT` *and include* `E1 V1 x4 Q0` *so that the SLC device may properly control the modem.*
Modem Timeout	Timeout for all modem connections. Select **Yes** (default) for the SLC console manager to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds. The default is 30 seconds.
Caller ID Logging	Select to enable the SLC unit to log caller IDs on incoming calls. Disabled by default. ***Note:*** *For the Caller ID* `AT` *command, refer to the modem user guide.*
Modem Command	Modem `AT` command used to initiate caller ID logging by the modem. ***Note:*** *For the* `AT` *command, refer to the modem user guide.*
Dial-back Number	Users with dial-back access can dial into the SLC console manager and enter their login and password. Once the SLC unit authenticates them, the modem hangs up and dials them back. Select the phone number the modem dials back on -a fixed number or a number associated with their login. If you select **Fixed Number**, enter the number (in the format 2123456789). The dial-back number is also used for CBCP client as the number for a user-defined number. See *Device Ports - Settings (on page 94)* for more information.
Dial-back Delay	For dial-back and CBCP Server, the number of seconds between the dial-in and dial-out portions of the dialing sequence.
Dial-back Retries	For dial-back and CBCP Server, the number of times the SLC or SLB unit will retry the dial-out portion of the dialing sequence if the first attempt to dial-out fails.

Text Mode

Timeout Logins	If you selected **Text** mode, you can enable logins to time out after the connection is inactive for a specified number of minutes. The default is **No**. This setting is only applicable for text mode connections. **PPP** mode connections stay connected until either side drops the connection. Disabled by default.

Dial-in Host List	From the drop-down list, select the desired host list. The host list is a prioritized list of SSH, Telnet, and TCP hosts that are available for establishing outgoing modem connections or for **connect direct** at the CLI. The hosts in the list are cycled through until the SLC console manager successfully connects to one. To establish and configure host lists, click the **Host Lists** link.

PPP Mode

Negotiate IP Address	If the SLC unit and/or the serial device have dynamic IP addresses (e.g., IP addresses assigned by a DHCP server), select **Yes**. **Yes** is the default. If the SLC console manager or the modem have fixed IP addresses, select **No**, and enter the **Local IP** (IP address of the port) and **Remote IP** (IP address of the modem).
Authentication	Enables **PAP** or **CHAP** authentication for modem logins. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the CHAP Handshake fields authenticate the user.
CHAP Handshake	The **Host/User Name** (for UNIX systems) or **Secret/User Password** (for Windows systems) used for CHAP authentication. May have up to 128 characters.
CHAP Auth Uses	For CHAP authentication, determines what is used to validate the CHAP host/ user sent by the remote peer: either the **CHAP Host** defined for the modem, or any of the users in the **Local Users** list.
Same authentication for Dial-in & Dial-on-Demand (DOD)	Select this option to let incoming connections (dial-in) use the same authentication settings as outgoing connections (dial-on-demand). If this option is not selected, then the dial-on-demand connections take their authentication settings from the DOD parameter settings. If **DOD Authentication** is **PAP**, then the **DOD CHAP Handshake** field is not used.
DOD Authentication	Enables **PAP** or **CHAP** authentication for dial-in & dial-on-demand. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the DOD CHAP Handshake fields authenticate the user.
DOD CHAP Handshake	For **DOD Authentication**, enter the **Host/User Name** for UNIX systems) or **Secret/User Password** (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Enable NAT	Select to enable Network Address Translation (NAT) for dial-in and dial-out PPP connections on a per modem (device port or USB port) basis. Users dialing into the SLC unit access the network connected to Eth1 and/or Eth2. ***Note:*** *IP forwarding must be enabled on the Network > Network Settings page for NAT to work. See Chapter 6: Basic Parameters on page 52.*
Dial-out Number	Phone number for dialing out to a remote system or serial device. May have up to 20 characters. Any format is acceptable.
Remote/Dial-out Login	User ID for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC or SLB device when it dials in. May have up to 32 characters.
Remote/Dial-out Pwd	Password for authentication when dialing out to a remote system, or if a remote system requests authentication from the SLC or SLB unit when it dials in. May have up to 64 characters.
Retype	Re-enter password for dialing out to a remote system.May have up to 64 characters.

Restart Delay	The number of seconds after the timeout and before the SLC console manager attempts another connection. The default is **30** seconds.
CBCP Server Allow No Callback	For CBCP Server state, allows "No Callback" as an option in the CBCP handshake in addition to User-defined Number and Admin-defined Number.
CBCP Client Type	For CBCP Client, this selects the number that the client would like to use for callback - either a user-defined number passed to the server (specified by the Fixed Dial-back Number) or an administrator-defined number determined by the server based on the login that is PAP or CHAP authenticated.

IP Settings

Service	The available connection services for this modem port (Telnet, SSH, or TCP). Only one can be active at a time. The default is None.
Telnet Port	Telnet Port Telnet session port number to use if you selected Telnet. Defaults: ◆ USB Port U1: **2049** ◆ USB Port U2: **2050** ◆ Range: **1025-65535**
SSH Port	The SSH session port number to use if you selected SSH. Defaults: ◆ USB Port U1: **3049** ◆ USB Port U2: **3050** ◆ Range: **1025-65535**
TCP Port	The TCP (raw) session port number to use if you selected TCP. Defaults: ◆ USB Port U1: **4049** ◆ USB Port U2: **4050** ◆ Range: **1025-65535**
Authenticate (checkbox)	If selected, the SLC unit requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet Port** and **SSH Port**, but not for **TCP Port**.

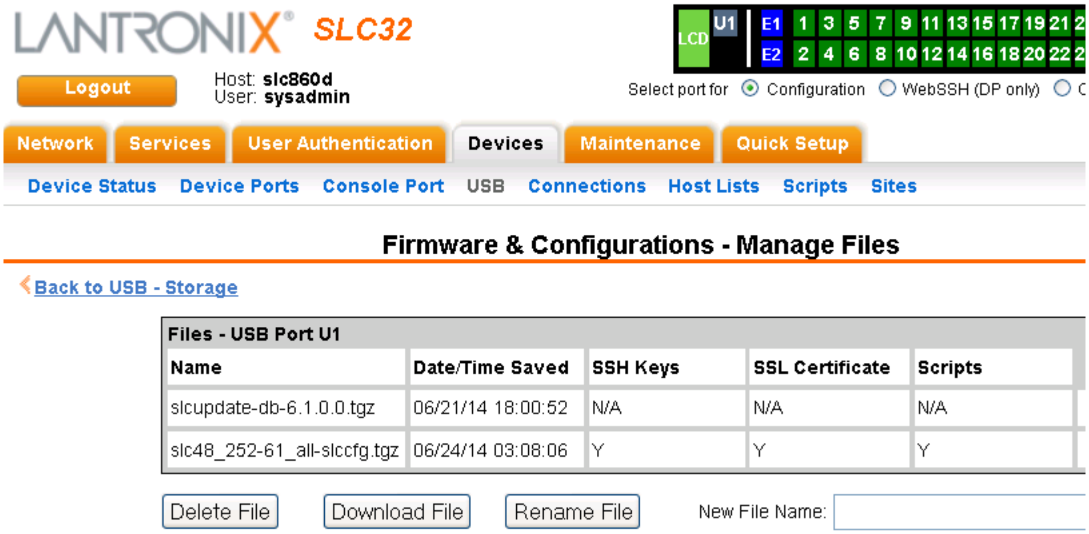
4. Click **Apply**.

Manage Firmware and Configuration Files

To manage any firmware and configuration files stored on a USB thumb drive, perform the following steps.

1. Click the **Manage Files on the Thumb Drive** link on the *Devices > USB > Configure* page.

Figure 10-4 Firmware and Configurations - Manage Files (Top of Page)



Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ C

Files - USB Port U1

Name	Date/Time Saved	SSH Keys	SSL Certificate	Scripts
slcupdate-db-6.1.0.0.tgz	06/21/14 18:00:52	N/A	N/A	N/A
slc48_252-61_all-slccfg.tgz	06/24/14 03:08:06	Y	Y	Y

New File Name:

Note: *At the bottom of the page, shown in Figure 10-4, are the **Delete**, **Download**, and **Rename** options.*

2. To delete a file, click the check box next to the filename and click **Delete File**. A confirmation message displays.
3. To download a file, click the **Download File** button. Select the file from the list.
4. To rename a file, click the check box next to the filename and enter a new name in the **New File Name** field.
5. Click **Rename File**.

USB Commands

The following CLI commands correspond to the USB port. For more information, see *Chapter 15: Command Reference*.

- `set usb access`
- `set usb modem`
- `set usb storage mount`
- `set usb storage unmount`
- `set usb storage dir`
- `set usb storage fsck`
- `set usb storage rename`
- `set usb storage copy`
- `set usb storage delete`
- `set usb storage format`
- `show usb`
- `show usb storage`
- `show usb modem`

11: Connections

Chapter 8: Device Ports described how to configure and interact with an SLC device port connected to an external device. This chapter describes how to use the *Devices > Connections* page to connect external devices and outbound network connections (such as Telnet or SSH) in various configurations.

Types of Endpoints and Connections

An SLC device port attached to an external device can be connected to one of the following endpoints:

- Another device port attached to an external device
- Another device port with a modem attached
- An outgoing Telnet or SSH session
- An outgoing TCP or UDP network connection

This enables the user to set up connections such as those described in the next section. You can establish a connection at various times:

- Immediately. These connections are always re-established after reboot.
- At a specified date and time. These connections connect if the date and time have already passed.
- After a specified amount of data or a specified sequence of data passes through the connection. Following reboot, the connection is not reestablished until the specified data passes through the connection.

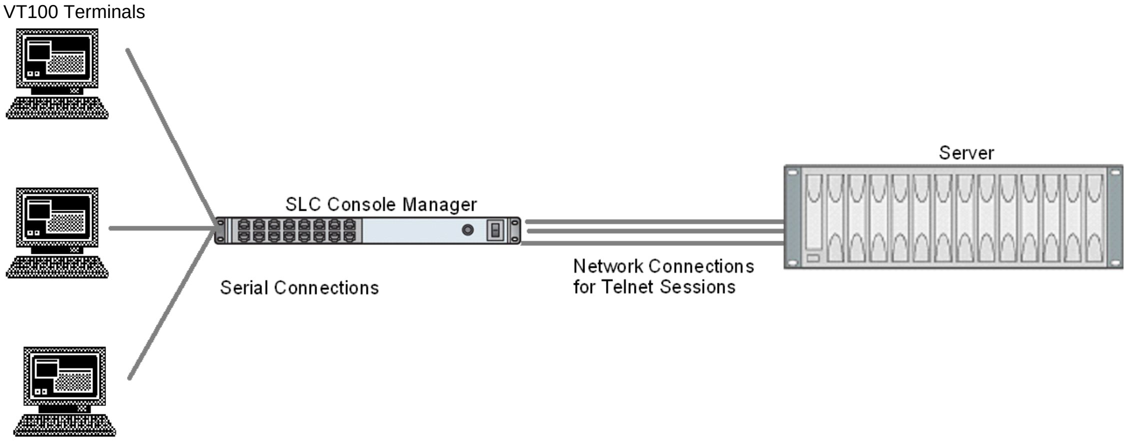
Typical Setup Scenarios for the SLC Unit

Following are typical configurations in which SLC connections can be used, with references to settings on the *Devices > Connections* and *Device Ports > Settings* web pages.

Terminal Server

In this setup, the SLC console manager acts as a single server computer. Terminal devices are connected to the serial ports of the SLC unit and configured as a **Device Port to Telnet out** type connection on the *Devices > Connections* page. The users of the terminals can access the server as if they were connected directly to it by local serial ports or a console.

Figure 11-1 Terminal Server

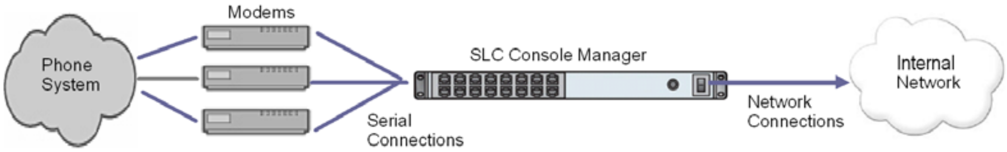


Remote Access Server

In this setup, the SLC console manager is connected to one or more modems by its device ports. Configure the device ports on the *Device Ports > Settings* web page by selecting the Dial-in option in the Modem Settings section.

Most customers use the modems in PPP mode to establish an IP connection to the SLC unit and either Telnet or SSH into the SLC. They could also select text mode where, using a terminal emulation program, a user could dial into the SLC unit and connect to the command line interface.

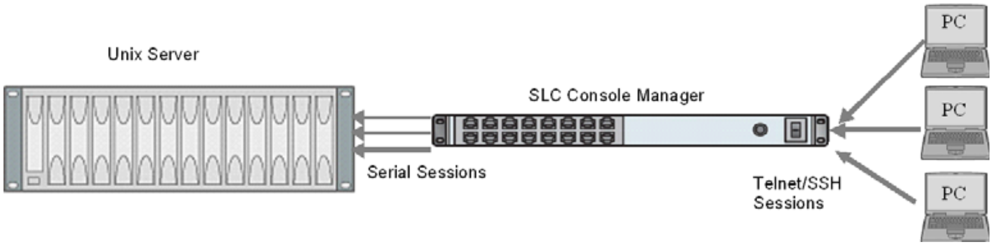
Figure 11-2 Remote Access Server



Reverse Terminal Server

In this scenario, the SLC console manager has one or more device ports connected to one or more serial ports of a mainframe server. Users can access a terminal session by establishing a Telnet or SSH session to the SLC device. To configure the SLC unit, select the **Enable Telnet In** or **Enable SSH In** option on the *Device Ports > Settings* page.

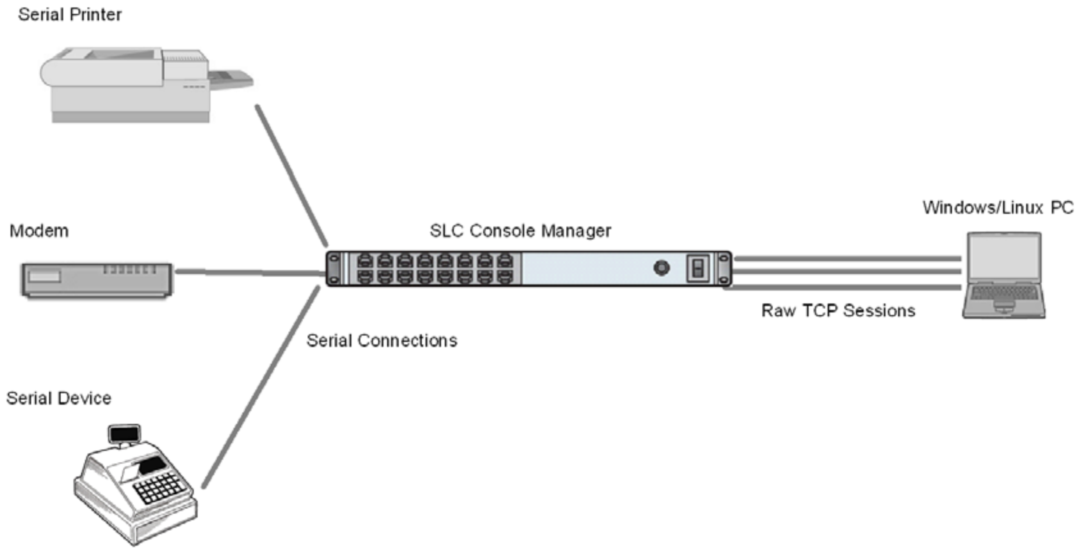
Figure 11-3 Reverse Terminal Server



Multiport Device Server

A PC can use the device ports on the SLC console manager as virtual serial ports, enabling the ports to act as if they are local ports to the PC. To use the SLC unit in this setup, the PC requires special software, for example, Com Port Redirector (available on www.lantronix.com or similar software).

Figure 11-4 Multiport Device Server



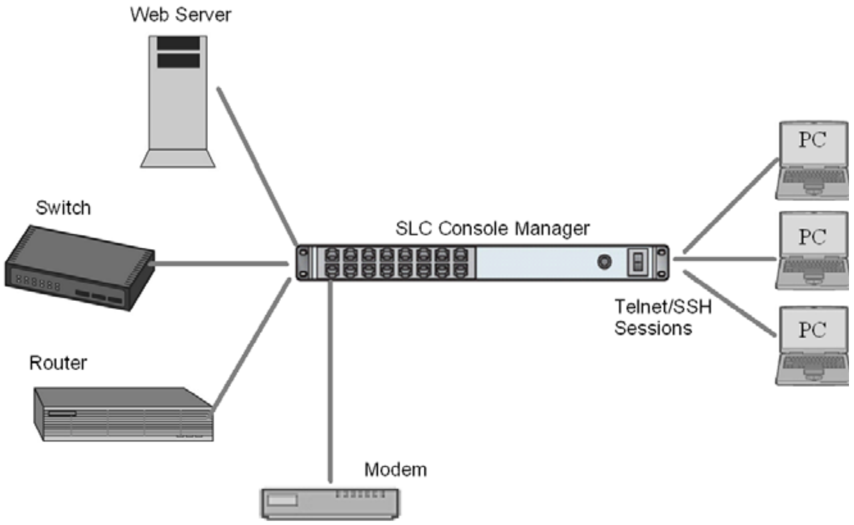
Console Server

For this situation, the SLC console manager is configured so that the user can manage a number of servers or pieces of network equipment using their console ports. The device ports on the SLC unit are connected to the console ports of the equipment that the user would like to manage.

To manage a specific piece of equipment, the user can Telnet or SSH to a specific port or IP address on the SLC console manager and be connected directly to the console port of the end server or device.

To configure this setup, set the **Enable Telnet** In or **Enable SSH** In option on the *Device Ports > Settings* page for the device port in question. The user can implement an extra remote management capability by adding a modem to one of the device ports and setting the **Dial-in** option in the Modem Settings section of the *Device Ports > Settings* page. A user could then dial into the SLC unit using another modem and terminal emulation program at a remote location.

Figure 11-5 Console Server

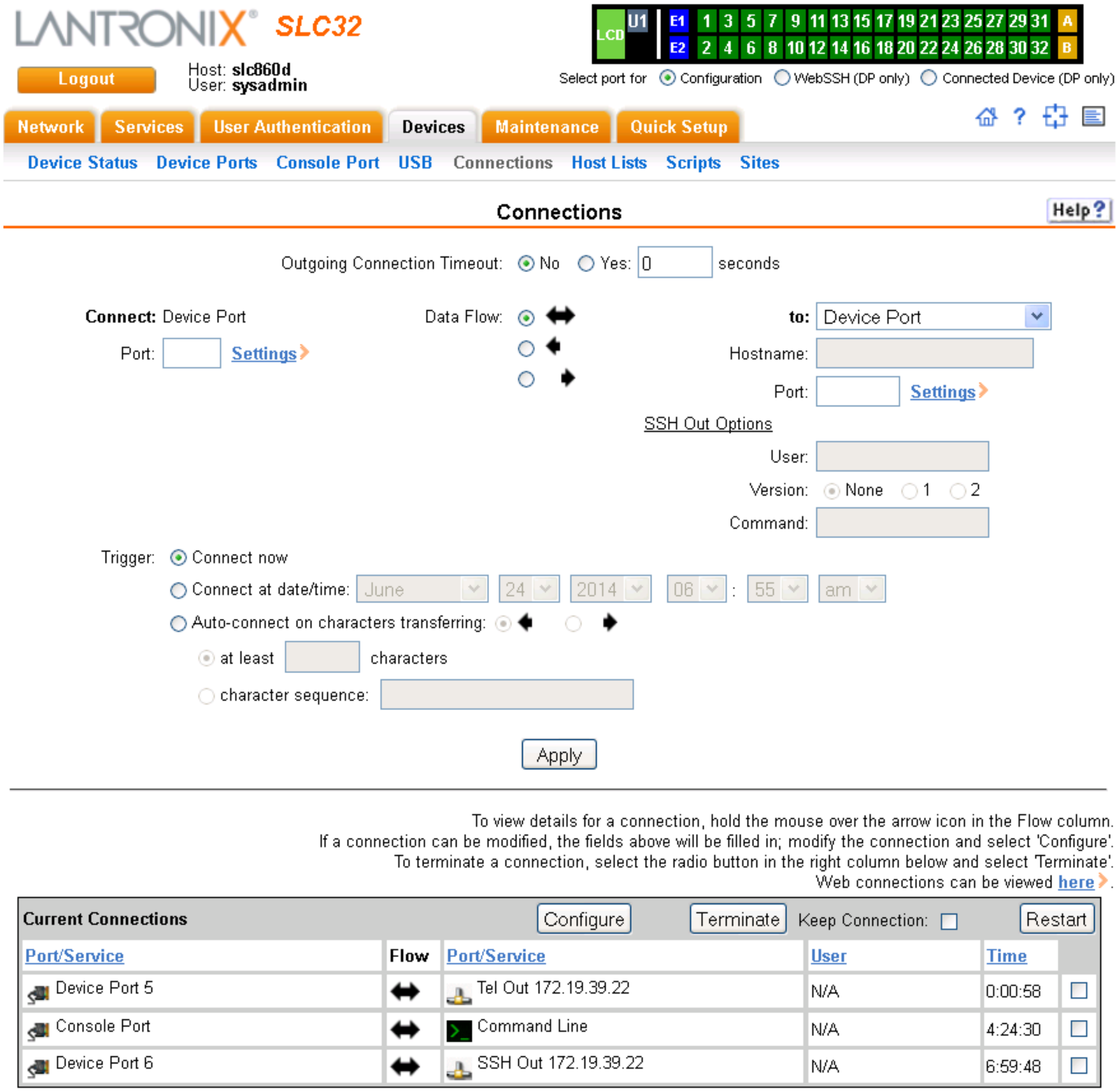


Connection Configuration

To create a connection:

1. Click the **Devices** tab and select the **Connections** option. The following page displays:

Figure 11-6 Devices > Connections



LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network Services User Authentication Devices Maintenance Quick Setup
Device Status Device Ports Console Port USB Connections Host Lists Scripts Sites
Help?

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Connections

Outgoing Connection Timeout: ● No ○ Yes: 0 seconds

Connect: Device Port

Port: Settings

Data Flow: ● ⇔ ○ ← ○ →

to: Device Port

Hostname:

Port: Settings

SSH Out Options

User:

Version: ● None ○ 1 ○ 2

Command:

Trigger: ● Connect now

○ Connect at date/time: June 24 2014 06 : 55 am

○ Auto-connect on characters transferring: ● ← ○ →

● at least characters

○ character sequence:

Apply

To view details for a connection, hold the mouse over the arrow icon in the Flow column.
If a connection can be modified, the fields above will be filled in; modify the connection and select 'Configure'.
To terminate a connection, select the radio button in the right column below and select 'Terminate'.
Web connections can be viewed here.

Current Connections Configure Terminate Keep Connection: □ Restart

Port/Service	Flow	Port/Service	User	Time	
Device Port 5	⇔	Tel Out 172.19.39.22	N/A	0:00:58	□
Console Port	⇔	Command Line	N/A	4:24:30	□
Device Port 6	⇔	SSH Out 172.19.39.22	N/A	6:59:48	□

2. For a device port, enter the following:

Outgoing Connection Timeout	Select to turn on or turn off the connection timeout: ◆ **No** for no timeout ◆ **Yes** for a timeout. Specify the number of seconds in the seconds field.
Port	The number of the device port you are connecting. This device port must be connected to an external serial device and must not have command line interface logins enabled, be connected to a modem, or be running a loopback test. *Note: To see the current settings for this device port, click the **Settings** link.*
Data Flow	Select the arrow showing the direction (bidirectional or unidirectional) the data will flow in relationship to the device port you are connecting.

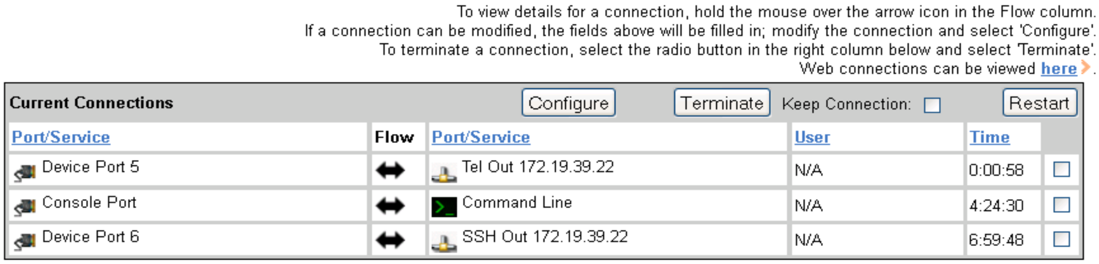
to	From the drop-down list, select a destination for the connection: a device port connected to a serial device, a device port connected to a modem, or an outbound network connection (Telnet, SSH, TCP Port, or UDP Port). *Note: To see the current settings for a selected device port, click the **Settings** link.*
Hostname	The host name or IP Address of the destination. This entry is required if the **to** field is set to Telnet out, SSH out, TCP port, or UDP port.
Port	If the **to** field is set to **Device Port** or **Modem on Device Port**, enter the number of the device port. For all other options, this is the TCP/UDP port number, which is optional for Telnet out and SSH out, but required for TCP Port and UDP Port. *Note: If you select **Device Port**, it must not have command line interface logins enabled or be running a loopback test. To view the device port's settings, click the **Settings** link to the right of the port number.*
SSH Out Options	Select one of the following optional flags to use for the SSH connection. ◆ **User:** Login ID to use for authenticating on the remote host. ◆ **Version:** Version of SSH. Select 1 or 2. ◆ **Command:** Enter a specific command on the remote host (for example, reboot).
Trigger	Select the condition that will trigger a connection. Options include: ◆ **Connect now:** Connects immediately, or if you reboot the SLC console manager, immediately on reboot. ◆ **Connect at date/time:** Connects at a specified date and time. Use the drop-down lists to complete the date and time. Upon rebooting, the SLC unit reestablishes the connection if the date/time has passed. ◆ **Auto-connect on characters transferring:** Select the arrow indicating the direction of the data transfer and either the minimum number of characters or a specific character sequence that will trigger the connection. You can select the direction of the data transfer only if **Data Flow** is bidirectional. Upon rebooting, the SLC console manager does not reestablish the connection until the specified data has passed through one of the endpoints of the connection.

3. To save, click the **Apply** button.

To view, update, or disconnect a current connection:

The bottom of the *Current Connections* page displays current connections.

Figure 11-7 Current Connections



To view details for a connection, hold the mouse over the arrow icon in the Flow column.
If a connection can be modified, the fields above will be filled in; modify the connection and select 'Configure'.
To terminate a connection, select the radio button in the right column below and select 'Terminate'.
Web connections can be viewed here.

Current Connections Configure Terminate Keep Connection: □ Restart

Port/Service	Flow	Port/Service	User	Time	
Device Port 5	⟷	Tel Out 172.19.39.22	N/A	0:00:58	□
Console Port	⟷	Command Line	N/A	4:24:30	□
Device Port 6	⟷	SSH Out 172.19.39.22	N/A	6:59:48	□

1. To view details about a connection, hold the mouse over the arrow in the **Flow** column.
2. To disconnect (delete) a connection, select the connection in the **Select** column and click the **Terminate** button.
3. To reestablish the connection, create the connection again in the top part of the page.
4. To view information about Web connections, click the here link in the text above the table. The *Maintenance > Firmware & Config* page displays.

Connection Commands

These commands for configuring connections correspond to the web page entries described above.

To connect to a device port to monitor and/or interact with it, or to establish an outbound network connection:

```
connect direct <endpoint>
```

Endpoint is one of:

```
deviceport <Port # or Name>
ssh <IP Address or Name> [port <TCP Port>] [<SSH flags>]
```

where `<SSH flags>` *is one or more of:*

```
   user <Login Name>
   version <1|2>
   command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
udp <IP Address> [port <UDP Port>]
hostlist <Host List>
```

To configure initial timeout for outgoing connections:

```
connect global outgoingtimeout <disable|1-9999 seconds>
```

Note: *This is not a TCP timeout.*

To monitor a device port:

```
connect listen deviceport <Device Port # or Name>
```

To connect a device port to another device port or an outbound network connection (data flows in both directions):

```
connect bidirection <Port # or Name> <endpoint>
```

Endpoint is one of:

```
charcount <# of Chars>
charseq <Char Sequence>
charxfer <toendpoint|fromendpoint>
deviceport <Device Port # or Name>
date <MMDDYYhhmm[ss]>
exclusive <enable|disable>
ssh <IP Address or Name> [port <TCP Port] [<SSH flags>]
```

where `<SSH flags>` *is one or more of:*

```
   user <Login Name>
   version <1|2>
   command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
trigger <now|datetime|chars>
udp <IP Address> [port <UDP Port>]
```

Note: If the trigger is datetime (establish connection at a specified date/time), enter the date parameter. If the trigger is chars (establish connection on receipt of a specified number or characters or a character sequence), enter the charxfer parameter and either the charcount or the charseq parameter.

To connect a device port to another device port or an outbound network connection (data flows in one direction):

```
connect unidirection <Device Port # or Name> dataflow <toendpoint|
fromendpoint> <endpoint>
```

Endpoint is one of:

```
charcount <# of Chars>
charseq <Char Sequence>
datetime <MMDDYYhhmm[ss]>
deviceport <Port # or Name>
exclusive <enable|disable>
ssh <IP Address or Name> [port <TCP Port] >]
<SSH flags>]
```

where `<SSH flags>` *is one or more of:*

```
   user <Login Name>
   version <1|2>
   command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port]
trigger <now|datetime|chars>
udp <IP Address> [port <UDP Port>]
```

Note: If the trigger is datetime (establish connection at a specified date/time), enter the date parameter. If the trigger is chars (establish connection on receipt of a specified number or characters or a character sequence), enter either the charcount or the charseq parameter.

To terminate a bidirectional or unidirectional connection:

```
connect terminate <Connection ID>
```

To view connections and their IDs:

```
show connections [email <Email Address>].
```

You can optionally email the displayed information.

Note: The connection IDs are in the left column of the resulting table. The connection ID associated with a particular connection may change if connection times out and is restarted.

To display details for a single connection:

```
show connections connid <Connection ID> [email <Email Address>
```

You can optionally email the displayed information.

To display global connections:

```
connect global show
```

12: User Authentication

Users who attempt to log in to the SLC console manager by means of Telnet, SSH, the console port, or one of the device ports are granted access by one or more authentication methods.

The User Authentication page provides a submenu of methods (Local Users, NIS, LDAP, RADIUS, Kerberos, and TACACS+) for authenticating users attempting to log in. Use this page to assign the order in which the SLC unit will use the methods. By default, local user authentication is enabled and is the first method the SLC console manager uses to authenticate users. If desired, you can disable local user authentication or assign it a lower precedence.

Note: *Regardless of whether local user authentication is enabled, the local user sysadmin account is always available for login.*

Authentication can occur using all methods, in the order of precedence, until a successful authentication is obtained, or using only the first authentication method that responds (in the event that a server is down).

If you have the same user name defined in multiple authentication methods, the result is unknown.

Example:

There is an LDAP user "joe" and an NIS user "joe" and the order of authentication methods is:

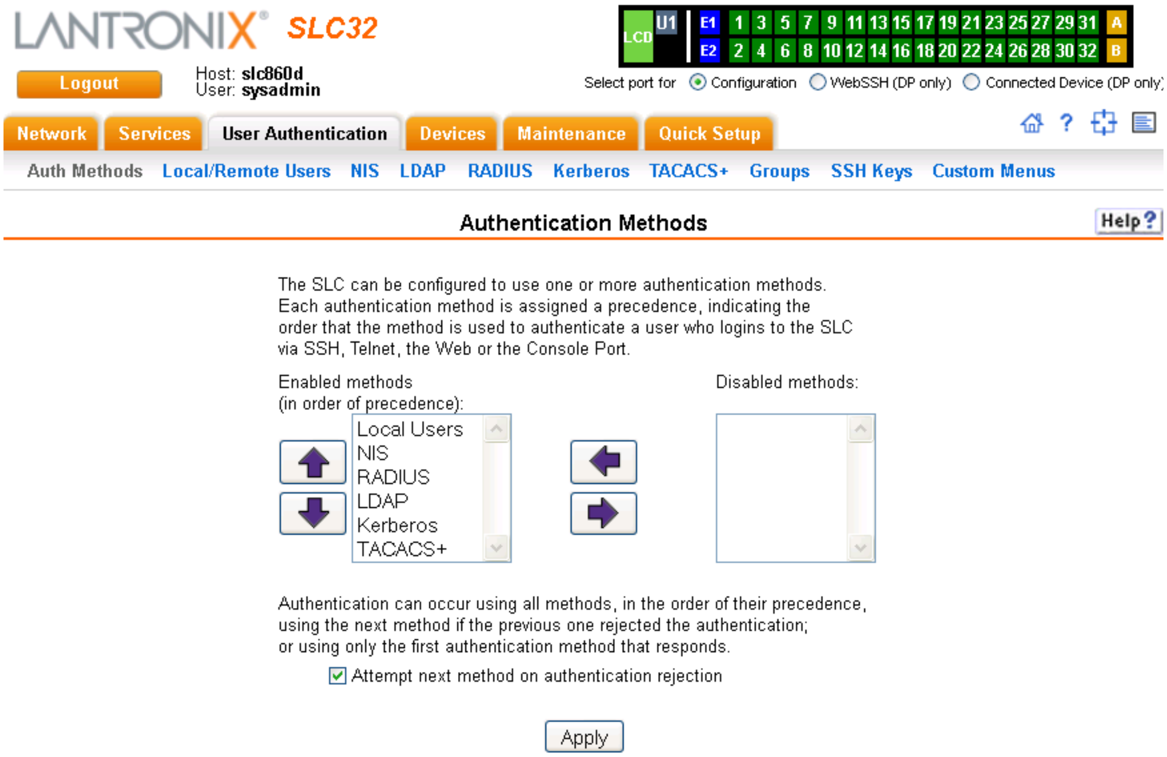
1. Local Users
2. LDAP
3. NIS

User "joe" tries to log in. Because there is an LDAP user "joe," the SLC unit tries to authenticate him against his LDAP password first. If he fails to log in, then the SLC device may (or may not) try to authenticate him against his NIS "joe" user password.

To enable, disable, and set the precedence of authentication methods:

1. From the main menu, select **User Authentication**. The following page displays:

Figure 12-1 User Authentication > Authentication Methods


LANTRONIX SLC32
Logout
Host: slc860d
User: sysadmin
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
Auth Methods Local/Remote Users NIS LDAP RADIUS Kerberos TACACS+ Groups SSH Keys Custom Menus
Help ?
Apply

Authentication Methods

The SLC can be configured to use one or more authentication methods. Each authentication method is assigned a precedence, indicating the order that the method is used to authenticate a user who logins to the SLC via SSH, Telnet, the Web or the Console Port.

Enabled methods (in order of precedence):

Local Users
NIS
RADIUS
LDAP
Kerberos
TACACS+

Disabled methods:

Authentication can occur using all methods, in the order of their precedence, using the next method if the previous one rejected the authentication; or using only the first authentication method that responds.

☑ Attempt next method on authentication rejection

2. To enable a method currently in the **Disabled methods** list, select the method and press the left ⬅ arrow to the left of the list. The methods include:

NIS (Network Information System)	A network naming and administration system developed by Sun Microsystems for smaller networks. Each host client or server computer in the system has knowledge about the entire system. A user at any host can access files or applications on any host in the network with a single user identification and password. NIS uses the client/server model and the Remote Procedure Call (RPC) interface for communication between hosts. NIS consists of a server, a library of client programs, and some administrative tools. NIS is often used with the Network File System (NFS).
LDAP (Lightweight Directory Access Protocol)	A set of protocols for accessing information directories, specifically X.500-based directory services. LDAP runs over TCP/IP or other connection-oriented transfer services.
RADIUS (Remote Authentication Dial-In User Service)	An authentication and accounting system used by many Internet Service Providers (ISPs). A client/server protocol, it enables remote access servers to authenticate dial-in users and authorize their access to the requested system or service. RADIUS allows a company to maintain user profiles in a central database that all remote servers can share. It increases security, allowing a company to set up a policy that can be applied at a single administered network point.
Kerberos	Kerberos is a network authentication protocol that enables two parties to exchange private information across an unprotected network. It works by assigning a unique electronic credential, called a ticket, to each user who logs on to the network. The ticket is embedded in messages to identify the sender.

TACACS+ (Terminal Access Controller Access Control System)	TACACS+ allows a remote access server to communicate with an authentication server to determine whether the user has access to the network. TACACS+ is a completely new protocol and is not compatible with TACACS or XTACACS. The SLC console manager supports TACACS+ only.

3. To disable a method currently in the **Enabled methods** list, select the method and click the right ➡ arrow between the lists.
4. To set the order in which the SLC unit will authenticate users, use the up ⬆ and down ⬇ arrows to the left of the **Enabled methods** list.
5. For **Attempt next method on authentication rejection**, you have the following options:
   - To enable the SLC console manager to use all methods, in order of precedence, until it obtains a successful authentication, select the check box. This is the default.
   - To enable the SLC device to use only the first authentication method that responds (in case a server is down or unavailable), clear the check box.
6. Click **Apply**.

Now that you have enabled one or more authentication methods, you must configure them.

Authentication Commands

The following command for the command line interface corresponds to the web page entries described above.

To set ordering of authentication methods:

Note: *Local Users authentication is always the first method used. Any methods omitted from the command will be disabled.*

```
set auth <one or more parameters>
```

Parameters:

```
authusenextmethod <enable|disable>
kerberos <1-6>
ldap <1-6>
localusers <1-6>
nis <1-6>
radius <1-6>
tacacs+ <1-6>
```

To view authentication methods and their order of precedence:

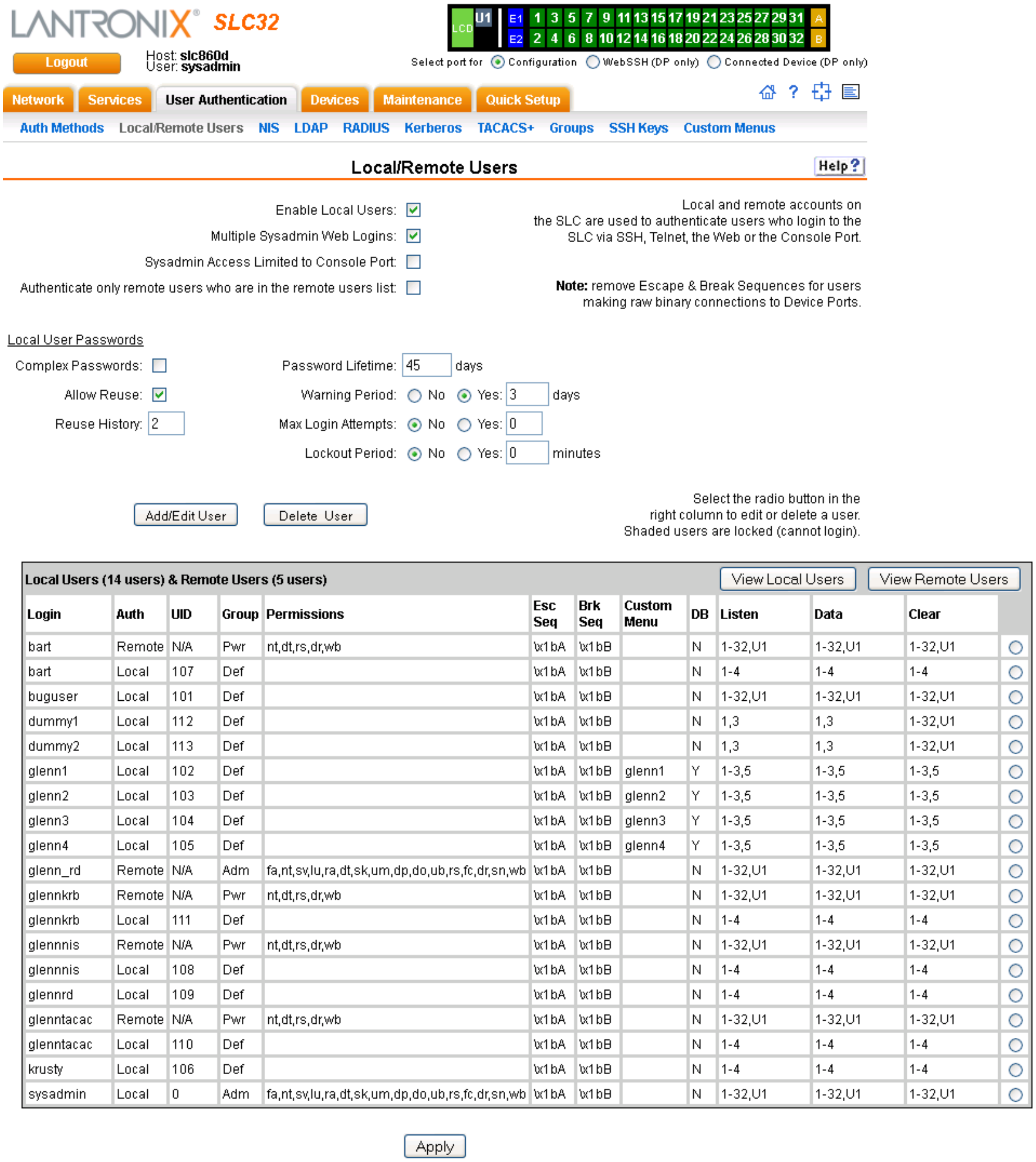
```
show auth
```

Local and Remote User Settings

The system administrator can configure the SLC console manager to use local accounts and remote accounts to authenticate users.

1. Click the **User Authentication** tab and select the **Local/Remote Users** option. The following page displays.

Figure 12-2 User Authentication > Local/Remote Users



Local/Remote Users

Enable Local Users: ☑
Multiple Sysadmin Web Logins: ☑
Sysadmin Access Limited to Console Port: □
Authenticate only remote users who are in the remote users list: □

Local and remote accounts on the SLC are used to authenticate users who login to the SLC via SSH, Telnet, the Web or the Console Port.

Note: remove Escape & Break Sequences for users making raw binary connections to Device Ports.

Local User Passwords

Complex Passwords: □
Allow Reuse: ☑
Reuse History: 2

Password Lifetime: 45 days
Warning Period: ○ No ● Yes: 3 days
Max Login Attempts: ● No ○ Yes: 0
Lockout Period: ● No ○ Yes: 0 minutes

Add/Edit User   Delete User

Select the radio button in the right column to edit or delete a user. Shaded users are locked (cannot login).

Local Users (14 users) & Remote Users (5 users)   View Local Users   View Remote Users

Login	Auth	UID	Group	Permissions	Esc Seq	Brk Seq	Custom Menu	DB	Listen	Data	Clear	
bart	Remote	N/A	Pwr	nt,dt,rs,dr,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
bart	Local	107	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
buguser	Local	101	Def		\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
dummy1	Local	112	Def		\x1bA	\x1bB		N	1,3	1,3	1-32,U1	○
dummy2	Local	113	Def		\x1bA	\x1bB		N	1,3	1,3	1-32,U1	○
glenn1	Local	102	Def		\x1bA	\x1bB	glenn1	Y	1-3,5	1-3,5	1-3,5	○
glenn2	Local	103	Def		\x1bA	\x1bB	glenn2	Y	1-3,5	1-3,5	1-3,5	○
glenn3	Local	104	Def		\x1bA	\x1bB	glenn3	Y	1-3,5	1-3,5	1-3,5	○
glenn4	Local	105	Def		\x1bA	\x1bB	glenn4	Y	1-3,5	1-3,5	1-3,5	○
glenn_rd	Remote	N/A	Adm	fa,nt,sv,lu,ra,dt,sk,um,dp,do,ub,rs,fc,dr,sn,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
glennkrb	Remote	N/A	Pwr	nt,dt,rs,dr,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
glennkrb	Local	111	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
glennnis	Remote	N/A	Pwr	nt,dt,rs,dr,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
glennnis	Local	108	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
glennrd	Local	109	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
glenntacac	Remote	N/A	Pwr	nt,dt,rs,dr,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○
glenntacac	Local	110	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
krusty	Local	106	Def		\x1bA	\x1bB		N	1-4	1-4	1-4	○
sysadmin	Local	0	Adm	fa,nt,sv,lu,ra,dt,sk,um,dp,do,ub,rs,fc,dr,sn,wb	\x1bA	\x1bB		N	1-32,U1	1-32,U1	1-32,U1	○

Apply

The top of the page has entry fields for enabling local and remote users and for setting password requirements. The bottom of the page displays a table listing and describing all local and remote users.

To enable local and/or remote users:

2. Enter the following:

Enable Local Users	Select to enable all local users except sysadmin. The sysadmin is always available regardless of how you set the check box. Enabled by default.
Multiple Sysadmin Web Logins	Select to allow the sysadmin to have multiple simultaneous logins to the web interface. Disabled by default.
Sysadmin Access Limited to Console Port	Select to limit sysadmin logins to the Console Port only. Disabled by default.
Authenticate only remote users who are in the remote users list	Select the check box to authenticate users listed in the Remote Users list in the lower part of the page. Disabled by default.

3. Continue to set **Local User Passwords:**

Complex Passwords	Select to enable the SLC unit to enforce rules concerning the password structure (e.g., alphanumeric requirements, number of characters, punctuation marks). Disabled by default. **Complexity rules:** Passwords must be at least eight characters long. They must contain one upper case letter (A-Z), one lower case letter (a-z), one digit (0-9), and one punctuation character (()`~!@#$%%^&*-+=\{}[]:;'"<>,.?/_).
Allow Reuse	Select to enable users to continue to reuse old passwords. If you disable the check box, they cannot use any of the **Reuse History** number of passwords. Enabled by default.
Reuse History	The number of passwords the user must use before reusing an old password. The default is **4**. For example, if you set reuse history to 4, the user may reuse an old password after using 4 other passwords.
Password Lifetime (days)	The number of days until the password expires. The default setting is **90**.
Warning Period (days)	The number of days ahead that the system warns that the user's password will expire. The default setting is **7**.
Max Login Attempts	The number of times (up to 8) the user can attempt to log in unsuccessfully before the system locks the user out. The default setting is **0** (disabled).
Lockout Period (minutes)	The number of minutes (up to 90) the locked-out user must wait before trying to log in to the web interface again. The default setting is **0** (disabled).

4. Click the **Apply** button.

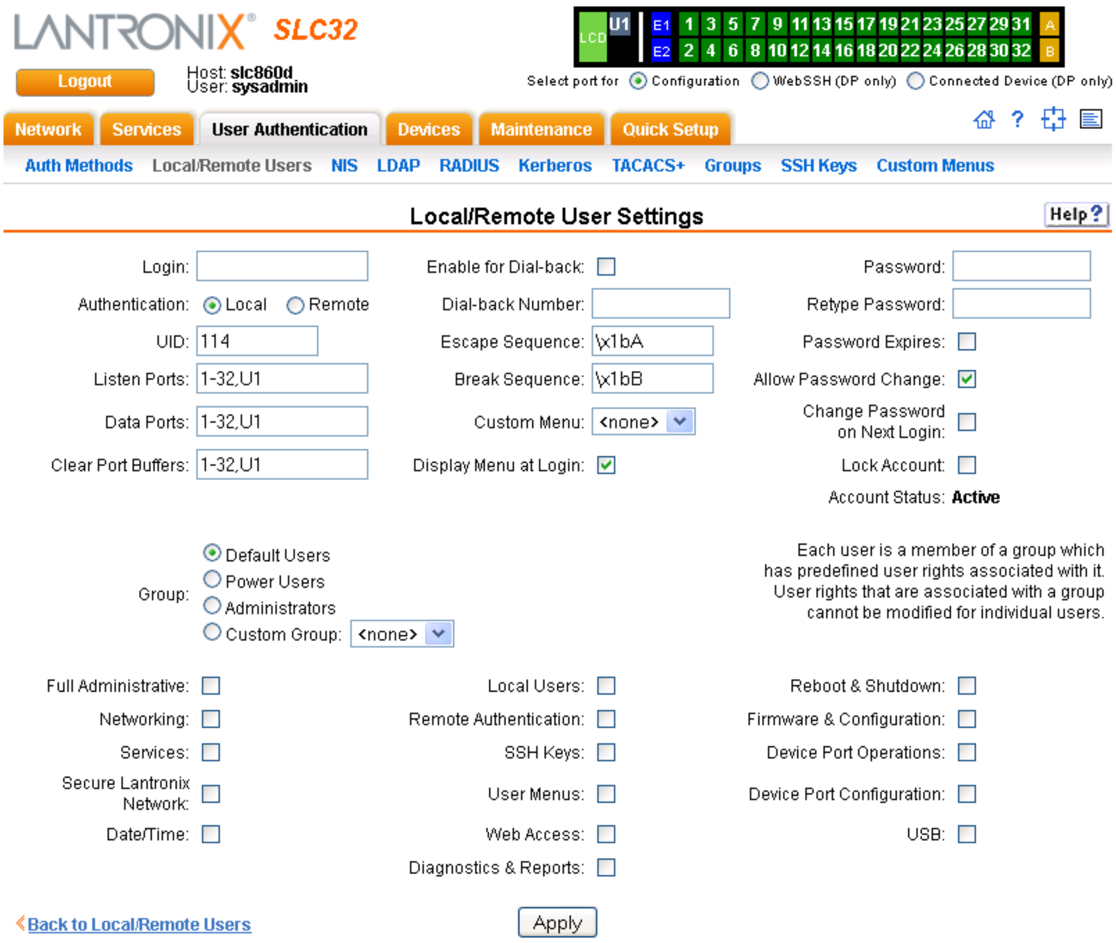
Adding, Editing or Deleting a User

Through this *User Authentication > Local/Remote Users* page, you can delete a user listed in the table or open a page for adding or editing a user.

To add a user:

1. On the *User Authentication > Local/Remote Users*, click the **Add/Edit User** button. The *User Authentication > Local/Remote User > Settings* page displays.

Figure 12-3 User Authentication > Local/Remote User > Settings


LANTRONIX SLC32
Logout
LCD U1 E1 E2 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 A 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 B
Network | Services | User Authentication | Devices | Maintenance | Quick Setup
Auth Methods | Local/Remote Users | NIS | LDAP | RADIUS | Kerberos | TACACS+ | Groups | SSH Keys | Custom Menus
Help?

Host: slc860d
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Local/Remote User Settings

Login:		Enable for Dial-back:	□	Password:	
Authentication:	● Local ○ Remote	Dial-back Number:		Retype Password:	
UID:	114	Escape Sequence:	\x1bA	Password Expires:	□
Listen Ports:	1-32,U1	Break Sequence:	\x1bB	Allow Password Change:	☑
Data Ports:	1-32,U1	Custom Menu:	<none>	Change Password on Next Login:	□
Clear Port Buffers:	1-32,U1	Display Menu at Login:	☑	Lock Account:	□
				Account Status:	**Active**

Group: ● Default Users ○ Power Users ○ Administrators ○ Custom Group: <none>

Each user is a member of a group which has predefined user rights associated with it. User rights that are associated with a group cannot be modified for individual users.

Full Administrative:	□	Local Users:	□	Reboot & Shutdown:	□
Networking:	□	Remote Authentication:	□	Firmware & Configuration:	□
Services:	□	SSH Keys:	□	Device Port Operations:	□
Secure Lantronix Network:	□	User Menus:	□	Device Port Configuration:	□
Date/Time:	□	Web Access:	□	USB:	□
		Diagnostics & Reports:	□		

Back to Local/Remote Users   Apply

2. Enter the following information for the user:

Login	User ID of selected user.
Authentication	Select the type of authenticated user: ◆ **Local:** User listed in the SLC database. ◆ **Remote:** User not listed in the SLC database.
UID	A unique numeric identifier the system administrator assigns to each user. Valid UIDs are 101-4294967295. *Note: The UID must be unique. If it is not, SLC console manager automatically increments it. Starting at 101, the SLC unit finds the next unused UID.*
Listen Ports	The device ports that the user may access to view data using the `connect listen` command. Enter the port numbers or the range of port numbers (for example, 1, 5, 8, 10-15).
Data Ports	The device ports with which the user may interact using the connect direct command. Enter the port numbers or the range of port numbers.
Clear Port Buffers	The device port buffers the users may clear using the `set locallog clear` command. Enter the port numbers or the range of port numbers.

Enable for Dial-back	Select to grant a local user dial-back access. Users with dial-back access can dial into the SLC console manager and enter their login and password. Once the SLC unit authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number (specified on the Device Port - Settings page), or on a number that is associated with the user's login (specified here).
Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as \x1bA, which is hexadecimal (\x) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is deviceport, tcp, or udp.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as \x1bB, which is hexadecimal (\x) character 27 (**1B**) followed by a **B**.
Custom Menu	If custom menus have been created, you can assign a default custom menu to the user. The custom menu will display at login. ***Note:*** *In the Local Users table, if the menu assigned to a local user no longer exists, it is marked with an asterisk (*).*
Display Menu at Login	If custom menus have been created, select to enable the menu to display when the user logs into the CLI.
Password / Retype Password	When a user logs into the SLC console manager, the unit prompts for a password (up to 64 characters). The sysadmin establishes that password here.
Password Expires	If not selected, allows the user to keep a password indefinitely. If selected the user keeps the password for a set period. (See the section, *Local and Remote User Settings (on page 168)* for information on specifying the length of time before the password expires.)
Allow Password Change	Select to allow the user to change password.
Change Password on Next Login	Indicate whether the user must change the password at the next login.
Lock Account	Select to lock the account indefinitely.
Account Status	Displays the current account status: ◆ Active ◆ Locked ◆ Locked (invalid logins)

3. Assign rights to users. Each user is a member of a group that has a predefined user rights associated with it. You can assign or remove additional rights to the individual user.

Group	Select the group to which the user will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user . ◆ **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. You can specify additional rights for the individual user. ◆ **Administrators:** This group has all possible rights. ◆ **Custom Group:** Select a custom group from the drop-down menu.
Full Administrative	Right to perform any function on the SLC console manager.
Networking	Right to enter network and routing settings.
Services	Right to enable and disable system and audit logging, SSH and Telnet logins, SNMP, and SMTP. Includes NFS and CIFS.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, and SLC units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user. Includes configuring remote authentication methods and ordering
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create or edit a custom user menu for the CLI.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to shutdown or reboot the SLC console manager.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings).
Device Port Operations	Right to control device ports.
Device Port Configuration	Right to enter device port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

4. Click the **Apply** button.
5. Click the **Back to Local/Remote Users** link to return to the Local/Remote User Settings page.
6. Add another user or click the **Back to Local/Remote Users** link. The Local/Remote Users page displays with the new user(s) listed in the table.

Note: The logged-in user's name displays at the top of the web page. Only the tabs and options for which the user has rights display.

Shortcut

To add a user based on an existing user:

1. Display the existing user on the Local/Remote Users Settings page. The fields in the top part of the page display the current values for the user.
2. Change the Login to that of the new user. It is best to change the Password too.
3. Click the **Apply** button.

To edit a local user:

1. On the Local/Remote Users page, select the user and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Update values as desired.
3. Click the **Apply** button.

To delete a local user:

1. On the Local/Remote Users page, select the user and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Click the **Delete User** button.
3. Click the **Apply** button.

To change the sysadmin password:

1. On the Local/Remote Users page, select **sysadmin** and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Enter the new password in the Password and Retype Password fields.

Note: *You can change Escape Sequence and Break Sequence, if desired. You cannot delete the UID or change the UID, port permissions, or custom menu.*

3. Click the **Apply** button.

Local Users Commands

The following CLI commands correspond to the web page entries described above.

To configure local accounts (including sysadmin) who log in to the SLC console manager by means of SSH, Telnet, the Web, or the console port:

```
set localusers add|edit <User Login> <parameters>
```

Parameters:

```
accessoutlets <Outlet List>
allowdialback <enable|disable>
breakseq <1-10 Chars>
changenextlogin <enable|disable>
changepassword <enable|disable>
clearports <Port List>
custommenu <Menu Name>
```

```
dataports <Port List>
dialbacknumber <Phone Number>
displaymenu <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin|Custom Group Name>
listenports <Port List>
passwordexpires <enable|disable>
permissions <Permission List>
uid <User Identifier>
```

To set whether a complex login password is required:

```
set localusers complexpasswords <enable|disable>
```

To enable or disable authentication of local users:

```
set localusers state <enable|disable>
```

To set a login password for the local user:

```
set localusers password <User Login>
```

To delete a local user:

```
set localusers delete <User Login>
```

To view settings for all users or a local user:

```
show localusers [user <User Login>]
```

To block (lock out) a user's ability to log in:

```
set localusers lock <User Login>
```

Note: *This capability is not available on the web page.*

To allow (unlock) a user's ability to log in:

```
set localusers unlock <User Login>
```

Note: *This capability is not available on the web page.*

Local User Rights Commands

The following CLI commands correspond to the web page entries described above.

To add a local user to a user group or to change the group the user belongs to:

```
set localusers add|edit <user> group <default|power|admin>
```

To set a local user's permissions (not defined by the user group):

```
set localusers add|edit <user> permissions <Permission List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad , po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To view the rights of the currently logged-in user:

```
show user
```

Remote User Commands

The following CLI commands correspond to the web page entries described above.

To configure whether remote users who are not part of the remote user list will be authenticated:

```
set remoteusers listonlyauth <enable|disable>
```

To configure attributes for users who log in by a remote authentication method:

```
set remoteusers add|edit <User Login> [<parameters>]
Parameters
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
group <default|power|admin|Custom Group Name>
listenports <Port List>
permissions <Permissions List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad, po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To remove a remote user:

```
set remoteusers delete <User Login>
```

To view settings for all remote users:

```
show remoteusers
```

To view the rights of the currently logged-in user:

```
show user
```

NIS

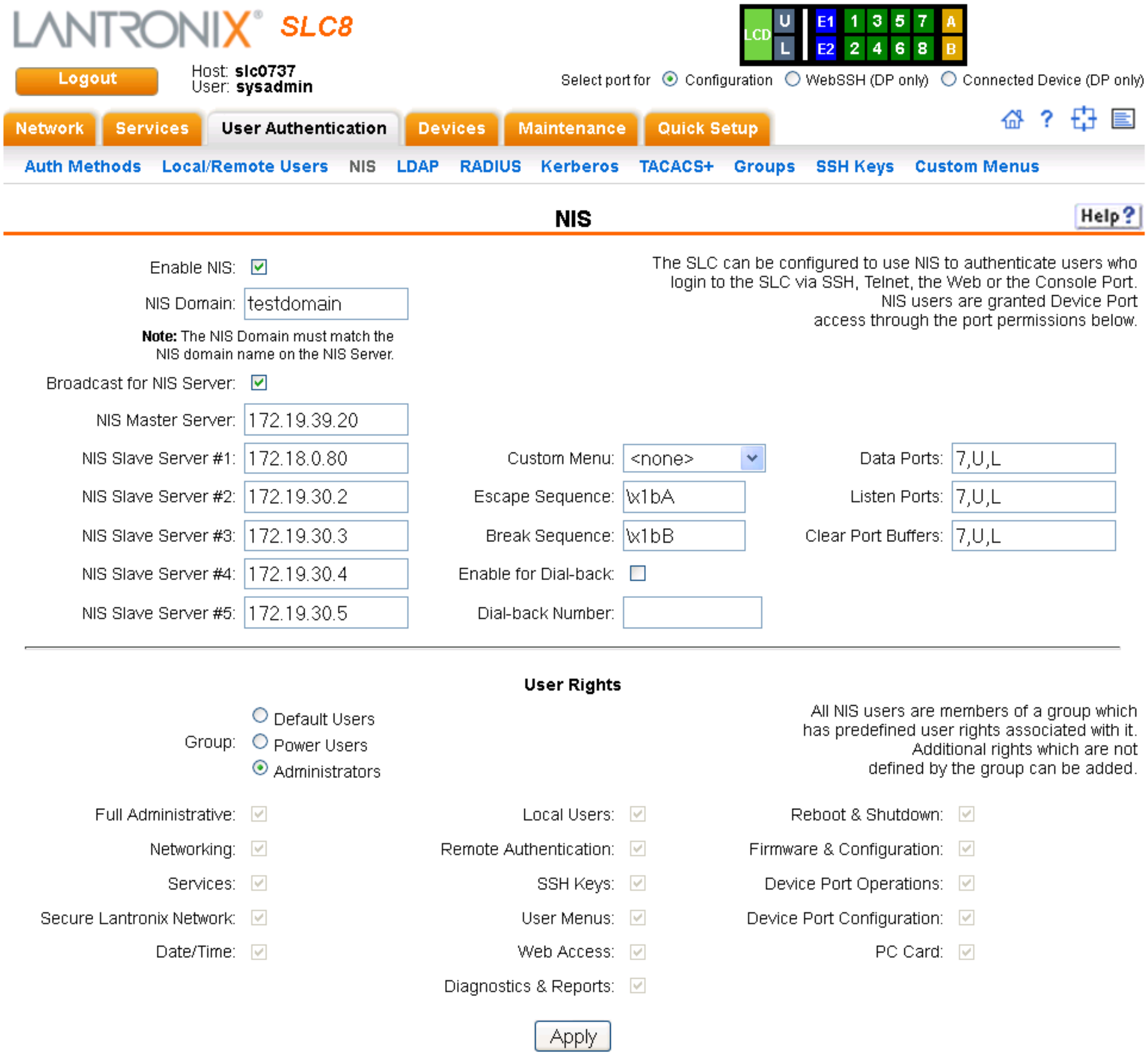
The system administrator can configure the SLC console manager to use NIS to authenticate users attempting to log in to the SLC unit through the Web, SSH, Telnet, or the console port. If NIS does not provide port permissions, you can use this page to grant device port access to users who are authenticated through NIS.

All NIS users are members of a group that has predefined user rights associated with it. You can assign additional user rights that are not defined by the group.

To configure the SLC unit to use NIS to authenticate users:

1. Click the **User Authentication** tab and select the **NIS** option.

Figure 12-4 User Authentication > NIS


LANTRONIX SLC8
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Logout
Network Services User Authentication Devices Maintenance Quick Setup
Auth Methods Local/Remote Users NIS LDAP RADIUS Kerberos TACACS+ Groups SSH Keys Custom Menus
Help?
Apply

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

NIS

The SLC can be configured to use NIS to authenticate users who login to the SLC via SSH, Telnet, the Web or the Console Port. NIS users are granted Device Port access through the port permissions below.

Enable NIS: ☑

NIS Domain: testdomain

Note: The NIS Domain must match the NIS domain name on the NIS Server.

Broadcast for NIS Server: ☑

NIS Master Server: 172.19.39.20

NIS Slave Server #1: 172.18.0.80

NIS Slave Server #2: 172.19.30.2

NIS Slave Server #3: 172.19.30.3

NIS Slave Server #4: 172.19.30.4

NIS Slave Server #5: 172.19.30.5

Custom Menu: <none>

Escape Sequence: \x1bA

Break Sequence: \x1bB

Enable for Dial-back: □

Dial-back Number:

Data Ports: 7,U,L

Listen Ports: 7,U,L

Clear Port Buffers: 7,U,L

User Rights

All NIS users are members of a group which has predefined user rights associated with it. Additional rights which are not defined by the group can be added.

Group: ○ Default Users ○ Power Users ● Administrators

Full Administrative: ☑
Networking: ☑
Services: ☑
Secure Lantronix Network: ☑
Date/Time: ☑

Local Users: ☑
Remote Authentication: ☑
SSH Keys: ☑
User Menus: ☑
Web Access: ☑
Diagnostics & Reports: ☑

Reboot & Shutdown: ☑
Firmware & Configuration: ☑
Device Port Operations: ☑
Device Port Configuration: ☑
PC Card: ☑

2. Enter the following:

Enable NIS	Displays selected if you enabled this method on the Authentication Methods page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable NIS here or on the first User Authentication page. If you enable NIS here, it automatically displays at the end of the order of precedence on the User Authentication page.*
NIS Domain	The NIS domain of the SLC console manager must be the same as the NIS domain of the NIS server.
Broadcast for NIS Server	If selected, the SLC unit sends a broadcast datagram to find the NIS Server on the local network.
NIS Master Server (required)	The IP address or host name of the master server.
NIS Slave Servers #1 -5	The IP addresses or host names of up to five slave servers.
Custom Menu	If custom menus have been created, you can assign a default custom menu to NIS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as \x1bA, which is hexadecimal (\x) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the connect direct command on the command line interface when the endpoint of the command is deviceport, tcp, or udp.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as \x1bB, which is hexadecimal (\x) character 27 (**1B**) followed by a **B**.
Enable for Dial-back	Select to grant a user *Dial-back (on page 136)*. Users with dial-back access can dial into the SLC unit and enter their login and password. Once the SLC console manager authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number, or on a number that is associated with the user’s login (specified here).
Data Ports	The ports users are able to monitor and interact with using the connect direct command.
Listen Ports	The ports users are able to monitor using the connect listen command.
Clear Port Buffers	The ports whose port buffer users may clear using the set locallog clear command.

3. In the **User Rights** section, select the user **Group** to which NIS users will belong:

Group	Select the group to which the NIS users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user . ◆ **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. ◆ **Administrators:** This group has all possible rights.

4. Assign or unassign **User Rights** for the specific user by checking or unchecking the following checkboxes:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, SLC, and SLB units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for NIS users.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC console manager and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Device Port Operations	Right to control device port settings.
Device Port Configuration	Right to enter device port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

5. Click the **Apply** button.

Note: You must reboot the unit before your changes will take effect.

NIS Commands

These commands for the CLI correspond to the web page entries described above.

To configure the SLC unit to use NIS to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set nis <one or more parameters>
```

Parameters:

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
broadcast <enable|disable>
clearports <Port List>
dataports <Port List>
domain <NIS Domain Name>
```

```
escapeseq <1-10 Chars>
listenports <Port List>
master <IP Address or Hostname>
slave1 <IP Address or Hostname>
slave2 <IP Address or Hostname>
slave3 <IP Address or Hostname>
slave4 <IP Address or Hostname>
slave5 <IP Address or Hostname>
state <enable|disable>
```

To set group and permissions for NIS users:

```
set nis group <default|power|admin>
```

To set permissions for NIS users not already defined by the user rights group:

```
set nis permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, ub, rs, rc, dr, wb, sn, ad, po, pc`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for NIS users:

```
set nis custommenu <Menu Name>
```

To view NIS settings:

```
show nis
```

LDAP

The system administrator can configure the SLC console manager to use LDAP to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

LDAP allows SLC users to authenticate using a wide variety of LDAP servers, such as OpenLDAP and Microsoft Active Directory. The LDAP implementation supports LDAP servers that do not allow anonymous queries.

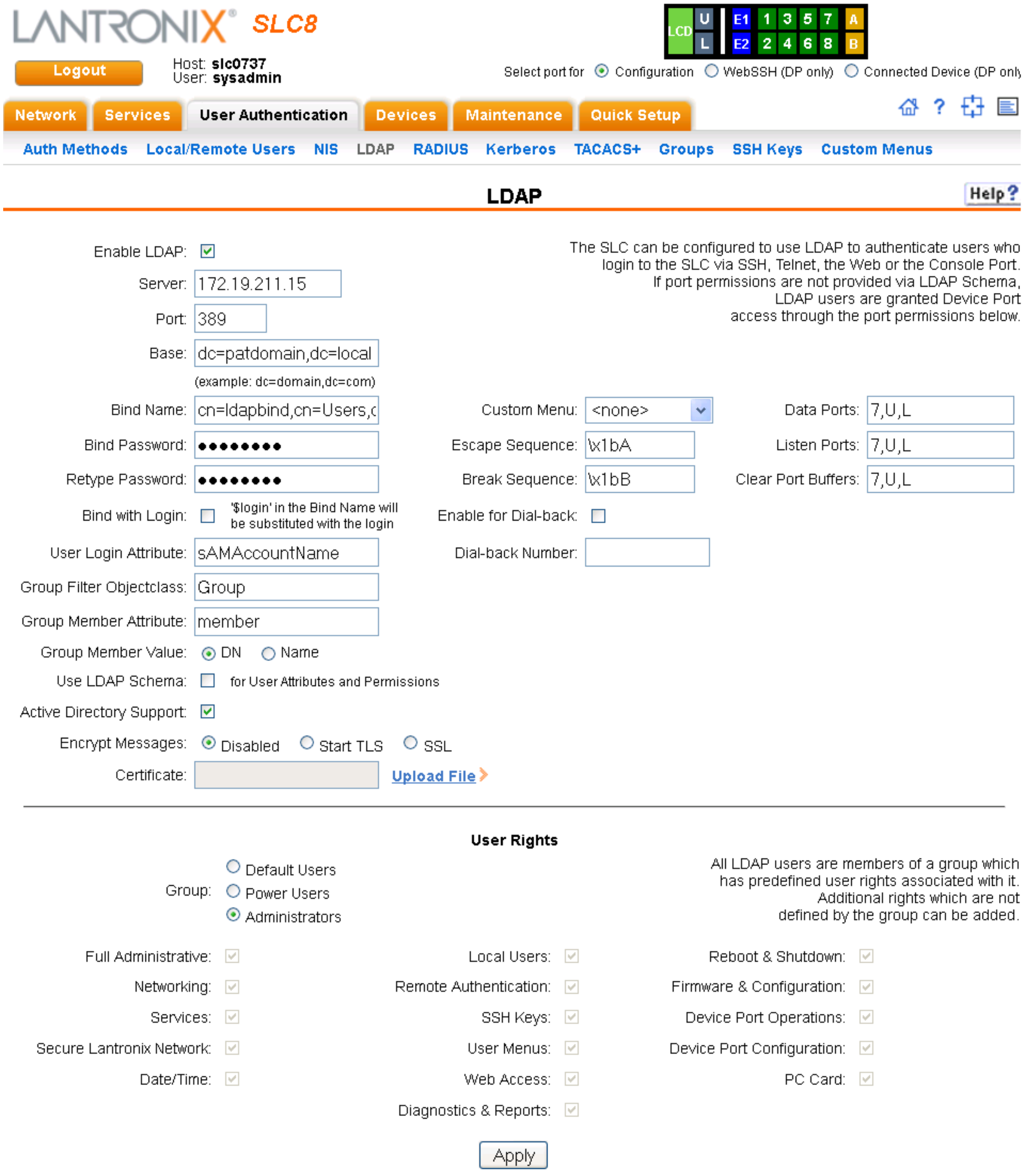
Users who are authenticated through LDAP are granted device port access through the port permissions on this page.

All LDAP users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC unit to use LDAP to authenticate users:

1. Click the **User Authentication** tab and select **LDAP**. The following page displays.

Figure 12-5 User Authentication > LDAP



LDAP

The SLC can be configured to use LDAP to authenticate users who login to the SLC via SSH, Telnet, the Web or the Console Port. If port permissions are not provided via LDAP Schema, LDAP users are granted Device Port access through the port permissions below.

Enable LDAP: ☑

Server: 172.19.211.15

Port: 389

Base: dc=patdomain,dc=local

(example: dc=domain,dc=com)

Bind Name: cn=ldapbind,cn=Users,c

Bind Password: ●●●●●●●●

Retype Password: ●●●●●●●●

Bind with Login: □ '$login' in the Bind Name will be substituted with the login

User Login Attribute: sAMAccountName

Group Filter Objectclass: Group

Group Member Attribute: member

Group Member Value: ● DN ○ Name

Use LDAP Schema: □ for User Attributes and Permissions

Active Directory Support: ☑

Encrypt Messages: ● Disabled ○ Start TLS ○ SSL

Certificate: Upload File

Custom Menu: <none>

Escape Sequence: \x1bA

Break Sequence: \x1bB

Enable for Dial-back: □

Dial-back Number:

Data Ports: 7,U,L

Listen Ports: 7,U,L

Clear Port Buffers: 7,U,L

User Rights

Group: ○ Default Users ○ Power Users ● Administrators

All LDAP users are members of a group which has predefined user rights associated with it. Additional rights which are not defined by the group can be added.

Full Administrative: ☑

Networking: ☑

Services: ☑

Secure Lantronix Network: ☑

Date/Time: ☑

Local Users: ☑

Remote Authentication: ☑

SSH Keys: ☑

User Menus: ☑

Web Access: ☑

Diagnostics & Reports: ☑

Reboot & Shutdown: ☑

Firmware & Configuration: ☑

Device Port Operations: ☑

Device Port Configuration: ☑

PC Card: ☑

Apply

2. Enter the following:

Enable LDAP	Displays selected if you enabled this method on the first User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox.
Server	The IP address or host name of the LDAP server.
Port	Number of the TCP port on the LDAP server to which the SLC talks. The default is **389**.
Base	The name of the LDAP search base (e.g., dc=company, dc=com). May have up to 80 characters.

Bind Name	The name for a non-anonymous bind to an LDAP server. This item has the same format as LDAP Base. One example is cn=administrator,cn=Users,dc=domain,dc=com
Bind Password / Retype Password	Password for a non-anonymous bind. This entry is optional. Acceptable characters are **a-z**, **A-Z**, and **0-9**. The maximum length is 127 characters.
Bind with Login	Select to bind with the login and password that a user is authenticating with. This requires that the Bind Name contain the `$login` token, which will be replaced with the current login. For example, if the Bind Name is `uid=$login,ou=People,dc=lantronix,dc=com`, and user `roberts` logs into the SLC , LDAP will bind with `uid=roberts,ou=People,dc=lantronix,dc=com` and the password entered by roberts.
User Login Attribute	The attribute used by the LDAP server for user logins. If nothing is specified for the user filter, the SLC unit will use "uid". For AD LDAP servers, the attribute for user logins is typically "sAMAccountName".
Group Filter Objectclass	The objectclass used by the LDAP server for groups. If nothing is specified for the group filter, the SLC device will use "posixGroup". For AD LDAP servers, the objectclass for groups is typically "Group".
Group Member Attribute	The attribute used by the LDAP server for group membership. This attribute may be use to search for a name (ie, "msmith") or a Distinguished Name (ie, "uid=msmith,ou=People,dc=lantronix,dc=com"). Select either Name or DN as appropriate for the LDAP server. If nothing is specified for the group membership attribute, the SLC console manager will use "memberUID" for name and "uniqueMember" for DN. For AD LDAP servers, the Group Membership Value is typically DN, with the Group Membership Attribute of "member".
Group Member Value	The attribute used by the LDAP server for group membership. This attribute may be use to search for a name (ie, "msmith") or a Distinguished Name (ie, "uid=msmith,ou=People,dc=lantronix,dc=com"). Select either Name or DN as appropriate for the LDAP server. If nothing is specified for the group membership attribute, the SLC unit will use "memberUID" for name and "uniqueMember" for DN. For AD LDAP servers, the Group Membership Value is typically DN, with the Group Membership Attribute of "member".
Use LDAP Schema	Select the check box to obtain remote user attributes (group/permissions and port access) from an Active Directory server's scheme via the user attribute 'SecureLinxSLCPerms'. See *User Attributes & Permissions from LDAP Schema or RADIUS VSA on page 189*. Disabled by default.
Active Directory Support	Select to enable. Active Directory is a directory service from Microsoft that is a part of Windows 2000 and later versions of Windows. It is LDAP- and Kerberos-compliant. Disabled by default.

Encrypt Messages	Select Start TLS or SSL to encrypt messages between the SLC or SLB unit and the LDAP server. If Start TLS is selected, the port will automatically be set to 389 and the StartTLS extension will be used to initiate a secure connection; if SSL is selected, the port will automatically be set to 636 and a SSL tunnel will be used for LDAP communication. The port number can be changed to a non-standard LDAP port; if the port number is set to anything other than 636, Start TLS will be used as the encryption method. Disabled by default.
	A certificate can be uploaded to the SLC or SLB unit for peer authentication. The certificate file is a file of CA certificates in PEM format. The file can contain several CA certificates identified by:
	`-----BEGIN CERTIFICATE-----`
	`(CA certificate in base64 encoding)`
	`-----END CERTIFICATE-----`
	sequences. Before, between, and after the certificates text is allowed which can be used e.g. for descriptions of the certificates.

Custom Menu	If custom menus have been created, you can assign a default custom menu to LDAP users. (*See Custom Menus on page 209.*)
Escape Sequence	A single character or a two-character sequence that causes the SLC unit to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **x1bA**, which is hexadecimal (**x**) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is deviceport, tcp, or udp.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **x1bB**, which is hexadecimal (**x**) character 27 (**1B**) followed by a **B**.
Enable for Dial-back	Select to grant a user dial-back access. Users with dial-back access can dial into the SLC console manager and enter their login and password. Once the SLC unit authenticates them, the modem hangs up and dials them back. Disabled by default.
DIal-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number, or on a number that is associated with the user's login (specified here).
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which LDAP users will belong:

Group	Select the group to which the LDAP users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user. ◆ **Power Users:** This group has the same rights as Default Users plus Networking, Date/Time, Reboot & Shutdown, and Diagnostics & Reports. ◆ **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, SLB, and SLC units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for LDAP users.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC console manager and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Device Port Operations	Right to control device ports.
Device Port Configuration	Right to enter device port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

LDAP Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC unit to use LDAP to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set ldap <one or more parameters>
```

Parameters:

```
accessoutlets <Outlet List>
adsupport <enable|disable>
```

Enables or disables active directory.

```
base <LDAP Base>
bindname <Bind Name>
```

```
breakseq <1-10 Chars>
dataports <Ports List>
listenports <Port List>
clearports <Port List>
escapeseq <1-10 Chars>
bindpassword <Bind Password>
encrypt <starttls|ssl|disable>
filteruser <User Login Attribute>
filtergroup <Group Objectclass>
grmemberattr <Group Membership Attribute>
grmembervalue <dn|name>
port <TCP Port>
```

*Default is **389**.*

```
server <IP Address or Hostname>
state <enable|disable>
```

To set user group and permissions for LDAP users:

```
group <default|power|admin>
```

To set permissions for LDAP users not already defined by the user rights group:

```
permissions <Permission List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad, po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for LDAP users:

```
custommenu <Menu Name>
```

To view LDAP settings:

```
show ldap
```

RADIUS

The system administrator can configure the SLC console manager to use RADIUS to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

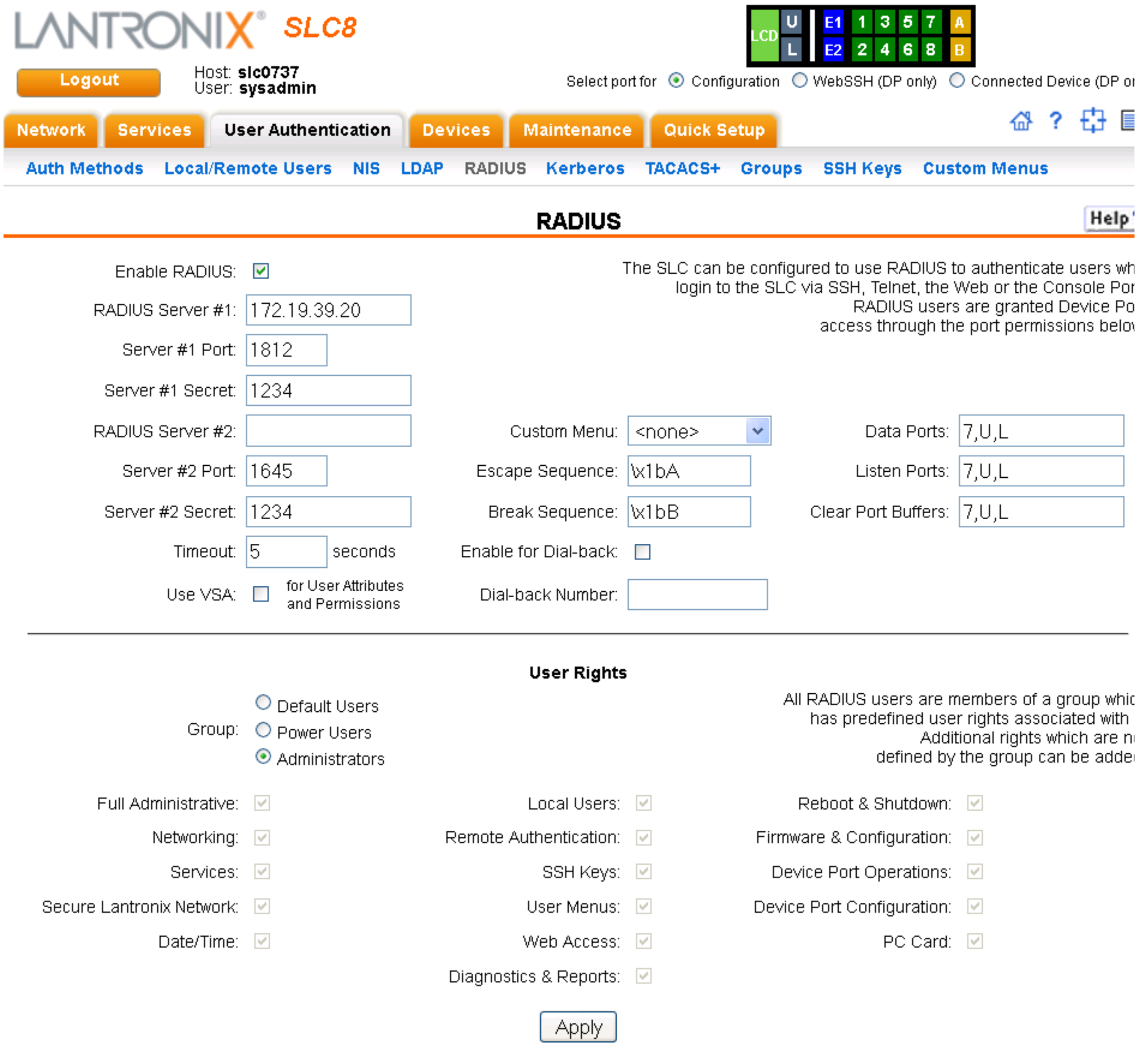
Users who are authenticated through RADIUS are granted device port access through the port permissions on this page.

All RADIUS users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC unit to use RADIUS to authenticate users:

1. Click the **User Authentication** tab and select **RADIUS**. The following page displays.

Figure 12-6 User Authentication > RADIUS



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP or

RADIUS

The SLC can be configured to use RADIUS to authenticate users wh login to the SLC via SSH, Telnet, the Web or the Console Por RADIUS users are granted Device Po access through the port permissions belo

Enable RADIUS: ☑
RADIUS Server #1: 172.19.39.20
Server #1 Port: 1812
Server #1 Secret: 1234
RADIUS Server #2:
Server #2 Port: 1645
Server #2 Secret: 1234
Timeout: 5 seconds
Use VSA: □ for User Attributes and Permissions

Custom Menu: <none>
Escape Sequence: \x1bA
Break Sequence: \x1bB
Enable for Dial-back: □
Dial-back Number:

Data Ports: 7,U,L
Listen Ports: 7,U,L
Clear Port Buffers: 7,U,L

User Rights

All RADIUS users are members of a group whic has predefined user rights associated with Additional rights which are n defined by the group can be adde

Group: ○ Default Users ○ Power Users ● Administrators

Full Administrative: ☑
Networking: ☑
Services: ☑
Secure Lantronix Network: ☑
Date/Time: ☑
Local Users: ☑
Remote Authentication: ☑
SSH Keys: ☑
User Menus: ☑
Web Access: ☑
Diagnostics & Reports: ☑
Reboot & Shutdown: ☑
Firmware & Configuration: ☑
Device Port Operations: ☑
Device Port Configuration: ☑
PC Card: ☑

2. Enter the following:

Enable RADIUS	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable RADIUS here or on the first User Authentication page. If you enable RADIUS here, it automatically displays at the end of the order of precedence on the User Authentication page.*
RADIUS Server #1	IP address or hostname of the primary RADIUS server. This RADIUS server may be a proxy for SecurID. SecurID is a two-factor authentication method based on the user's SecurID token and pin number. The SecurID token displays a string of digits called a token code that changes once a minute (some tokens are set to change codes every 30 seconds).
Server #1 Port	Number of the TCP port on the RADIUS server used for the RADIUS service. If you do not specify an optional port, the SLC console manager uses the default RADIUS port (**1812**).
Server #1 Secret	Text that serves as a shared secret between a RADIUS client and the server (SLC). The shared secret is used to encrypt a password sent between the client and the server. May have up to 128 characters.
RADIUS Server #2	IP address or host name of the secondary RADIUS server. This server can be used as a SecurID proxy.
Server #2 Port	Number of the TCP port on the RADIUS server used for the RADIUS service. If you do not specify an optional port, the SLC console manager uses the default RADIUS port (**1812**).
Server #2 Secret	Text that serves as a shared secret between a RADIUS client and the server (SLC). The shared secret is used to encrypt a password sent between the client and the server. May have up to 128 characters.
Timeout	The number of seconds (1-30) after which the connection attempt times out. The default is **30** seconds.
Use VSA	Select the check box to obtain remote user attributes (group/permissions and port access) from the RADIUS server via the Vendor-Specific Attribute (VSA). For details on the format of the VSA, see *User Attributes & Permissions from LDAP Schema or RADIUS VSA on page 189*.
Custom Menu	If custom menus have been created, you can assign a default custom menu to RADIUS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as \x1bA, which is hexadecimal (\x) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as \x1bB, which is hexadecimal (\x) character 27 (**1B**) followed by a **B**.

Enable for Dial-back	Select to grant a user dial-back access. Users with dial-back access can dial into the SLC unit and enter their login and password. Once the SLC unit authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number, or on a number that is associated with the user's login (specified here).
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

Note: *Older RADIUS servers may use **1645** as the default port. Check your RADIUS server configuration.*

3. In the **User Rights** section, select the user group to which RADIUS users will belong.

Group	Select the group to which the RADIUS users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user. ◆ **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. ◆ **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, SLC and SLB unit) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for NIS users.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Device Port Operations	Right to control device ports.
Device Port Configuration	Right to access to port settings.

USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

5. Click the **Apply** button.

Note: You must reboot the unit before your changes will take effect.

RADIUS Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC console manager to use RADIUS to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set radius <one or more parameters>
```

Parameters:

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
listenports <Port List>
state <enable|disable>
```

To identify the RADIUS server(s), the text secret, and the number of the TCP port on the RADIUS server:

```
set radius server <1|2> host <IP Address or Hostname> secret <Secret>
[port <TCP Port>]
```

*The default port is **1812**.*

To set the number of seconds after which the connection attempt times out:

```
set radius timeout <disable|1-30>
```

May be 1-30 seconds.

To set user group and permissions for RADIUS users:

```
set radius group <default|power|admin>
```

To set permissions for RADIUS users not already defined by the user rights group:

```
set radius permissions <Permission List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad, po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for RADIUS users:

```
set radius custommenu <Menu Name>
```

To view RADIUS settings:

```
show radius
```

User Attributes & Permissions from LDAP Schema or RADIUS VSA

Remote user attributes (group/permissions and port access) can be obtained from an Active Directory server's schema via the user attribute 'secureLinxSLCPerms', or from a RADIUS server's Vendor-Specific Attribute (see below). This attribute is a set of parameter-value pairs. Each parameter and value is separated by a space, and a space separates each parameter-value pair. Whitespace is not supported in the value strings. The parameters that are supported are:

- **rights** - User rights. The value string is a comma-separated list of two letter user permissions. Example: "nt,wb,ra".
- **data** - Data port access. The value string specifies the list of ports the user has 'direct' access to. Example: "2,4-18,U,L".
- **listen** - Listen port access. The value string specifies the list of ports the user has 'listen' access to.
- **clear** - Clear port access. The value string specifies the list of port buffers the user has the right to clear.
- **group** - User group. Valid values for the value string are "default", "power", and "admin", and any SLC or SLB custom group name. If a custom group name is specified and it matches a current SLC custom group name, any **rights** attribute will be ignored, and the custom group's rights (permissions) will be used instead. A group name with spaces cannot be specified.
- **escseq** - Escape sequence. The value string specifies the user's escape sequence. Use "\x" to specify non-printable characters. For example, "\x1bA" specifies the sequence "ESC-A".
- **brkseq** - Break sequence. The value string specifies the user's break sequence.
- **menu** - Custom user menu. The value string specifies the user's custom user menu.
- **display** - Display custom user menu when a user logs into the CLI. Valid values for the value string are "yes" and "no".
- **dbnumber** - Dial-back number. The value string specifies the user's dial-back number for modem dial-back connections.
- **allowdb** - Allow a user to have dial-back access. Valid values for the value string are "yes" and "no".

RADIUS servers will need to be configured to support the Lantronix Vendor-Specific Attribute. For example, on a FreeRADIUS server, the dictionary will need be updated with the Lantronix definition by including the contents below in a file named *dictionary.lantronix*, and including it in the RADIUS server dictionary definitions by adding the appropriate `$INCLUD`E directive to the main dictionary file.

```
# dictionary.lantronix
#
# Lantronix SLC Secure Lantronix Console Manager
# Provides SLC-specific user attributes
#
VENDOR Lantronix 244

BEGIN-VENDOR Lantronix

ATTRIBUTE Lantronix-User-Attributes 1 string

END-VENDOR Lantronix
```

Once this is complete, the users file can be updated to include the Lantronix VSA for any user:

```
myuser    Auth-Type := Local, User-Password == "myuser_pwd"
          Reply-Message = "Hello, %u",
          Lantronix-User-Attributes = "data 1-4 listen 1-6 clear 1-4
          group power"
```

Kerberos

Kerberos is a network authentication protocol that provides strong authentication for client/server applications by using secret-key cryptography.

The system administrator can configure the SLC console manager to use Kerberos to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

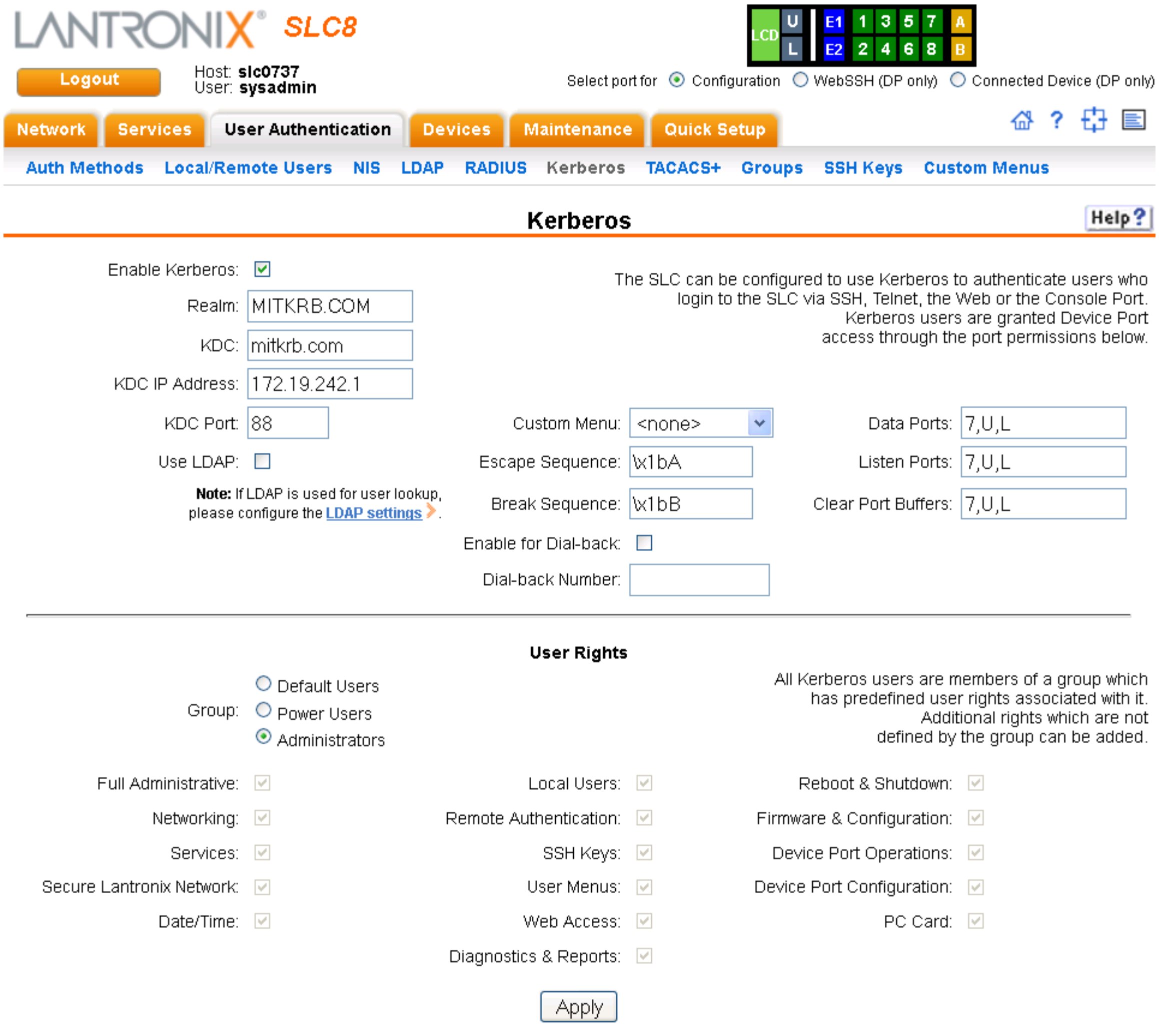
Users who are authenticated through Kerberos are granted device port access through the port permissions on this page.

All Kerberos users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC unit to use Kerberos to authenticate users:

1. Click the **User Authentication** tab and select the **Kerberos** option. The following page displays.

Figure 12-7 User Authentication > Kerberos



LANTRONIX SLC8
Logout
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Network | Services | User Authentication | Devices | Maintenance | Quick Setup
Auth Methods | Local/Remote Users | NIS | LDAP | RADIUS | Kerberos | TACACS+ | Groups | SSH Keys | Custom Menus
Help ?
Apply

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Kerberos

The SLC can be configured to use Kerberos to authenticate users who login to the SLC via SSH, Telnet, the Web or the Console Port. Kerberos users are granted Device Port access through the port permissions below.

Enable Kerberos: ☑
Realm: MITKRB.COM
KDC: mitkrb.com
KDC IP Address: 172.19.242.1
KDC Port: 88
Use LDAP: □

Note: If LDAP is used for user lookup, please configure the LDAP settings.

Custom Menu: <none>
Escape Sequence: \x1bA
Break Sequence: \x1bB
Enable for Dial-back: □
Dial-back Number:

Data Ports: 7,U,L
Listen Ports: 7,U,L
Clear Port Buffers: 7,U,L

User Rights

Group: ○ Default Users ○ Power Users ● Administrators

All Kerberos users are members of a group which has predefined user rights associated with it. Additional rights which are not defined by the group can be added.

Full Administrative: ☑
Networking: ☑
Services: ☑
Secure Lantronix Network: ☑
Date/Time: ☑
Local Users: ☑
Remote Authentication: ☑
SSH Keys: ☑
User Menus: ☑
Web Access: ☑
Diagnostics & Reports: ☑
Reboot & Shutdown: ☑
Firmware & Configuration: ☑
Device Port Operations: ☑
Device Port Configuration: ☑
PC Card: ☑

2. Enter the following:

Enable Kerberos	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable Kerberos here or on the first User Authentication page. If you enable Kerberos here, it automatically displays at the end of the order of precedence on the User Authentication page.*
Realm	Enter the name of the logical network served by a single Kerberos database and a set of Key Distribution Centers. Usually, realm names are all uppercase letters to differentiate the realm from the Internet domain. Realm is similar in concept to an NT domain.
KDC	A key distribution center (KDC) is a server that issues Kerberos tickets. A ticket is a temporary set of electronic credentials that verify the identity of a client for a particular service. Enter the **KDC** in the fully qualified domain format (FQDN). An example is SLC.local.
KDC IP Address	Enter the IP address of the Key Distribution Center (KDC).

KDC Port	Port on the KDC listening for requests. Enter an integer with a maximum value of 65535. The default is **88**.
Use LDAP	Indicate whether Kerberos should rely on LDAP to look up user IDs and Group IDs. This setting is disabled by default. ***Note:*** *Make sure to configure LDAP if you select this option.*
Custom Menu	If custom menus have been created, you can assign a default custom menu to RADIUS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **x1bA**, which is hexadecimal (**x**) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as **x1bB**, which is hexadecimal (**x**) character 27 (**1B**) followed by a **B**.
Enable for Dial-back	Select to grant a user dial-back access. Users with dial-back access can dial into the SLC unit and enter their login and password. Once the SLC device authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number, or on a number that is associated with the user’s login (specified here).
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which Kerberos users will belong.

Group	Select the group to which the Kerberos users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user. ◆ **Power Users:** This group has the same rights as Default Users plus Networking, Date/Time, Reboot & Shutdown, and Diagnostics & Reports. ◆ **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, SLC and SLB units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.

Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for Kerberos users.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC console manager and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Device Port Operations	Right to control device ports.
Device Port Configuration	Right to access to port settings.
USB	Right to enter modem settings for USB devices. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

Kerberos Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC unit to use Kerberos to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set kerberos <one or more parameters>
```

Parameters:

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
ipaddr <Key Distribution Center IP Address>
kdc <Key Distribution Center>
listenports <Port List>
port <Key Distribution Center TCP Port>
realm <Kerberos Realm>
state <enable|disable>
useldapforlookup <enable|disable>
```

To set user group and permissions for Kerberos users:

```
set kerberos group <default|power|admin>
```

To set permissions for Kerberos users not already defined by the user rights group:

```
set kerberos permissions <Permission List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad, po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for Kerberos users:

```
set kerberos custommenu <Menu Name>
```

To view Kerberos settings:

```
show kerberos
```

TACACS+

Similar to RADIUS, the main function of TACACS+ is to perform authentication for remote access. The SLC console manager supports the TACACS+ protocol (not the older TACACS or XTACACS protocols).

The system administrator can configure the SLC unit to use TACACS+ to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

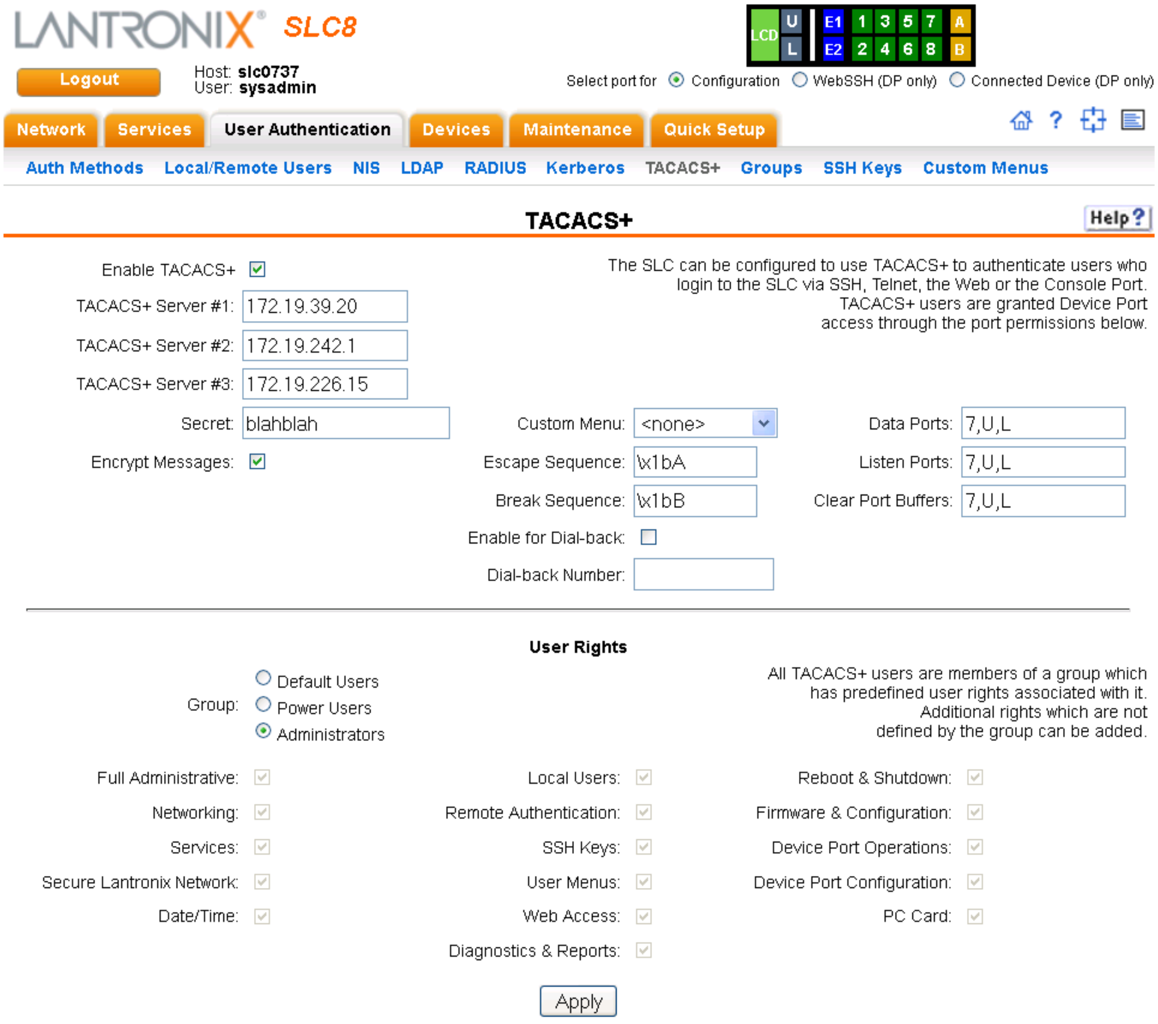
Users who are authenticated through Kerberos are granted device port access through the port permissions on this page.

All Kerberos users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC console manager to use TACACS+ to authenticate users:

1. Click the **TACACS+** tab and select **TACACS+**. The following page displays.

Figure 12-8 User Authentication > TACACS+



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

TACACS+

The SLC can be configured to use TACACS+ to authenticate users who login to the SLC via SSH, Telnet, the Web or the Console Port. TACACS+ users are granted Device Port access through the port permissions below.

Enable TACACS+:	☑
TACACS+ Server #1:	172.19.39.20
TACACS+ Server #2:	172.19.242.1
TACACS+ Server #3:	172.19.226.15
Secret:	blahblah
Encrypt Messages:	☑

Custom Menu:	<none>	Data Ports:	7,U,L
Escape Sequence:	\x1bA	Listen Ports:	7,U,L
Break Sequence:	\x1bB	Clear Port Buffers:	7,U,L
Enable for Dial-back:	☐		
Dial-back Number:			

User Rights

All TACACS+ users are members of a group which has predefined user rights associated with it. Additional rights which are not defined by the group can be added.

Group: ○ Default Users ○ Power Users ● Administrators

Full Administrative:	☑	Local Users:	☑	Reboot & Shutdown:	☑
Networking:	☑	Remote Authentication:	☑	Firmware & Configuration:	☑
Services:	☑	SSH Keys:	☑	Device Port Operations:	☑
Secure Lantronix Network:	☑	User Menus:	☑	Device Port Configuration:	☑
Date/Time:	☑	Web Access:	☑	PC Card:	☑
		Diagnostics & Reports:	☑		

2. Enter the following:

Enable TACACS+	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. You can enable TACACS+ here or on the first User Authentication page. If you enable TACACS+ here, it automatically displays at the end of the order of precedence on the User Authentication page.
TACACS+ Servers 1-3	IP address or host name of up to three TACACS+ servers.
Secret	Shared secret for message encryption between the SLC console manager and the TACACS+ server. Enter an alphanumeric secret of up to 127 characters.
Encrypt Messages	Select the checkbox to encrypt messages between the SLC unit and the TACACS+ server. Selected by default.
Custom Menu	If custom menus have been created (see the User Guide), you can assign a default custom menu to TACACS+ users.

Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **x1bA**, which is hexadecimal (**x**) character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **x1bB**, which is hexadecimal (**x**) character 27 (**1B**) followed by a **B**.
Enable for Dial-back	Select to grant a user dial-back access. Users with dial-back access can dial into the SLC unit and enter their login and password. Once the SLC device authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number, or on a number that is associated with the user's login (specified here).
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command.
Listen Ports	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which TACACS+ users will belong.

Group	Select the group to which the TACACS+ users will belong: ◆ **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user. ◆ **Power Users:** This group has the same rights as Default Users plus Networking, Date/Time, Reboot & Shutdown, and Diagnostics & Reports. ◆ **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP and Spider units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for TACACS+ users.
Web Access	Right to access Web-Manager.

Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC console manager and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects Reboot & Shutdown.
Device Port Operations	Right to control device ports.
Device Port Configuration	Right to access to port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

TACACS+ Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC console manager to use TACACS+ to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set tacacs+ <one or more parameters>
```

Parameters:

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
encrypt <enable|disable>
escapeseq <1-10 Chars>
listenports <Port List>
secret <TACACS+ Secret>
server1 <IP Address or Name>
server2 <IP Address or Name>
server3 <IP Address or Name>
state <enable|disable>
```

To set user group and permissions for TACACS+ users:

```
set tacacs+ group <default|power|admin>
```

To set permissions for TACACS+ users not already defined by the user rights group:

```
set tacacs+ permissions <Permission List>
```

where

```
<Permission List> is one or more of nt, sv, dt, lu, ra, sk, um, dp, ub,
rs, rc, dr, wb, sn, ad, po, pc
```

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for TACACS+ users:

```
set tacacs+ custommenu <Menu Name>
```

To view TACACS+ settings:

```
show tacacs+
```

Groups

The SLC console manager has 3 pre-defined groups: Administrators, Power Users, and Default Users. Custom groups can also be created; each custom group is a set of user attributes and permissions. Local Users and Remote Users defined on the SLC unit can be assigned to one of the pre-defined groups or a custom group. When a user authenticates, if they belong to custom group, they will be granted the custom group attributes and permissions, rather than their individual attributes and permissions. The SLC device supports querying a LDAP server for groups that a LDAP user is a member of; if any of the LDAP group names match a (Custom Group Name), the LDAP user will be granted the rights of the custom group.

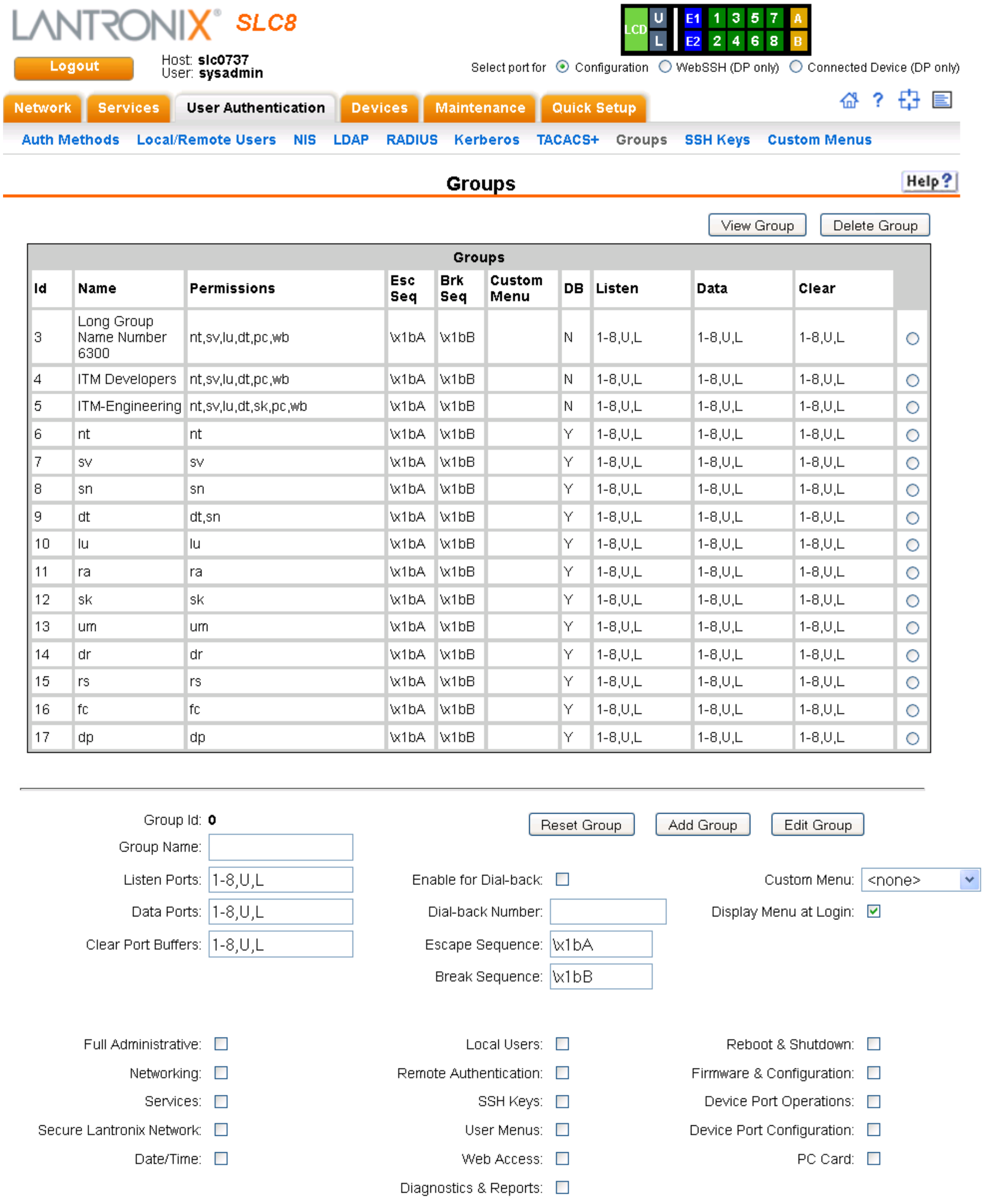
A custom group cannot be given the name of one of the pre-defined groups: "Admin", "Power" or "Default" (or any version of these names where the case of the letters is different) since these names are used for the SLC pre-defined groups. Any LDAP group that matches one of these pre-defined group names will be ignored and not used to assign rights to a user.

To configure Groups in the SLC console manager:

1. From the main menu, select **User Authentication - Groups**. The following page displays.

Note: If the fields in the lower part of the page have been populated by viewing another group, the fields can be cleared by selecting the Reset Group button.

Figure 12-9 User Authentication > Group



LANTRONIX® SLC8
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Logout
Network Services User Authentication Devices Maintenance Quick Setup
Auth Methods Local/Remote Users NIS LDAP RADIUS Kerberos TACACS+ Groups SSH Keys Custom Menus
Help?
View Group Delete Group
Reset Group Add Group Edit Group

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Groups

Id	Name	Permissions	Esc Seq	Brk Seq	Custom Menu	DB	Listen	Data	Clear	
3	Long Group Name Number 6300	nt,sv,lu,dt,pc,wb	\x1bA	\x1bB		N	1-8,U,L	1-8,U,L	1-8,U,L	○
4	ITM Developers	nt,sv,lu,dt,pc,wb	\x1bA	\x1bB		N	1-8,U,L	1-8,U,L	1-8,U,L	○
5	ITM-Engineering	nt,sv,lu,dt,sk,pc,wb	\x1bA	\x1bB		N	1-8,U,L	1-8,U,L	1-8,U,L	○
6	nt	nt	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
7	sv	sv	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
8	sn	sn	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
9	dt	dt,sn	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
10	lu	lu	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
11	ra	ra	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
12	sk	sk	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
13	um	um	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
14	dr	dr	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
15	rs	rs	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
16	fc	fc	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○
17	dp	dp	\x1bA	\x1bB		Y	1-8,U,L	1-8,U,L	1-8,U,L	○

Group Id: **0**
Group Name:
Listen Ports: 1-8,U,L
Data Ports: 1-8,U,L
Clear Port Buffers: 1-8,U,L

Enable for Dial-back: □
Dial-back Number:
Escape Sequence: \x1bA
Break Sequence: \x1bB

Custom Menu: <none>
Display Menu at Login: ☑

Full Administrative: □
Networking: □
Services: □
Secure Lantronix Network: □
Date/Time: □

Local Users: □
Remote Authentication: □
SSH Keys: □
User Menus: □
Web Access: □
Diagnostics & Reports: □

Reboot & Shutdown: □
Firmware & Configuration: □
Device Port Operations: □
Device Port Configuration: □
PC Card: □

2. Enter the following:

Group Name	Enter a name for the group.
Listen Ports	The ports users are able to monitor using the `connect listen` command.

Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. Enter the port numbers or the range of port numbers (for example, 1, 5, 8, 10-15). **U1** denotes the USB port on the front of the SLC console manager. For SLC/SLB models with an internal modem, **U2** denotes the internal modem.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.
Enable for Dial-back	Select to grant a user. Users with dial-back access can dial into the SLC unit and enter their login and password. Once the SLC device authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either on a fixed number, or on a number that is associated with the user's login (specified here).
Escape Sequence	A single character or a two-character sequence that causes the SLC console manager to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 **(1B)** followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of one to ten characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 **(1B)** followed by a **B**.
Custom Menu	If custom menus have been created you can assign a default custom menu to the group. See *Custom Menus* for more information.
Display Menu at Login	Check the checkbox to display the menu at login.

3. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Secure Lantronix Network	Right to view and manage Secure Lantronix units (e.g., SLP, Spider, or SLC units) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create or edit a custom user menu for the CLI.
Web Access	Right to access Web-Manager.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Reboot & Shutdown	Right to use the CLI or shut down the SLC device and then reboot it.

Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings).
Device Port Operations	Right to enter control device ports.
Device Port Configuration	Right to enter device port settings.
USB	Right to enter modem settings for USB. The USB checkbox is available for certain SLC and SLB models.
PC Card	Right to enter modem settings for PC cards. Includes managing storage PC cards. The PC card checkbox is available for certain SLC and SLB models.

4. Click the **Add Group** button.

To view or update a group:

1. In the **Groups** table, select the group and click the **View Group** button. The group attributes and permissions will be displayed in the lower section of the page.
2. Modify the group attributes and permissions and click the **Edit Group** button.

To delete a group:

1. Select the group in the **Groups** table.
2. Click the **Delete Group** button.

SSH Keys

The SLC console manager can import and export SSH keys to facilitate shared key authentication for all incoming and outgoing SSH connections. By using a public/private key pair, a user can access multiple hosts with a single passphrase, or, if a passphrase is not used, a user can access multiple hosts without entering a password. In either case, the authentication is protected against security attacks because both the public key and the private key are required to authenticate. For both imported and exported SSH keys, the SLC unit supports both RSA and DSA keys, and can import and export keys in OpenSSH and SECSH formats. Imported and exported keys are saved with the SLC configuration, and the administrator has the option of retaining the SSH keys during a reset to factory defaults.

The SLC device can also update the SSH RSA1, RSA and DSA host keys that the SSH server uses with site-specific host keys or reset them to the default values.

Imported Keys

Imported SSH keys must be associated with an SLC local user. The key can be generated on host "MyHost" for user "MyUser," and when the key is imported into the SLC unit, it must be associated with either "MyUser" (if "MyUser" is an existing SLC local user) or an alternate SLC local user. The public key file can be imported via SCP or FTP; once imported, you can view or delete the public key. Any SSH connection into the SLC console manager from the designated host/user combination uses the SSH key for authentication.

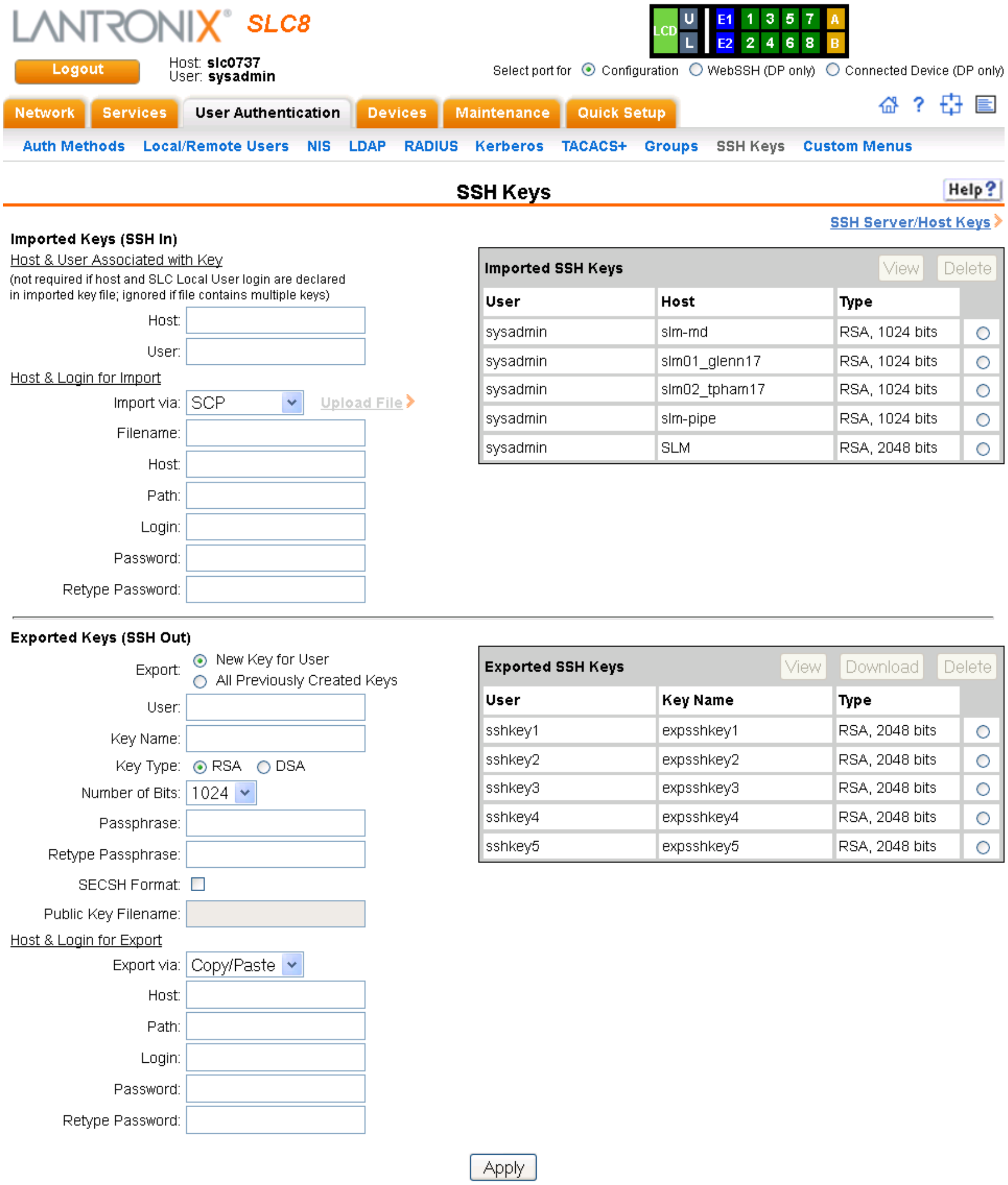
Exported Keys

The SLC console manager can generate SSH keys for SSH connections out of the SLC device for any SLC user. The SLC unit retains both the private and public key on the SLC console manager , and makes the public key available for export via SCP, FTP, or copy and paste. The name of the key is used to generate the name of the public key file that is exported (for example, <keyname>.pub), and the exported keys are organized by user and key name. Once a key is generated and exported, you can delete the key or view the public portion. Any SSH connection out of the SLC unit for the designated host/user combination uses the SSH key for authentication.

To configure the SLC unit to use SSH keys to authenticate users:

1. From the main menu, select **User Authentication - SSH Keys**. The following page displays.

Figure 12-10 User Authentication > SSH Keys



Host: **slc0737**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

SSH Keys

Imported Keys (SSH In)

Host & User Associated with Key
(not required if host and SLC Local User login are declared in imported key file; ignored if file contains multiple keys)

Host:
User:

Host & Login for Import

Import via: SCP
Filename:
Host:
Path:
Login:
Password:
Retype Password:

Imported SSH Keys

User	Host	Type	
sysadmin	slm-md	RSA, 1024 bits	○
sysadmin	slm01_glenn17	RSA, 1024 bits	○
sysadmin	slm02_tpham17	RSA, 1024 bits	○
sysadmin	slm-pipe	RSA, 1024 bits	○
sysadmin	SLM	RSA, 2048 bits	○

Exported Keys (SSH Out)

Export: ● New Key for User ○ All Previously Created Keys
User:
Key Name:
Key Type: ● RSA ○ DSA
Number of Bits: 1024
Passphrase:
Retype Passphrase:
SECSH Format: □
Public Key Filename:

Host & Login for Export

Export via: Copy/Paste
Host:
Path:
Login:
Password:
Retype Password:

Exported SSH Keys

User	Key Name	Type	
sshkey1	expsshkey1	RSA, 2048 bits	○
sshkey2	expsshkey2	RSA, 2048 bits	○
sshkey3	expsshkey3	RSA, 2048 bits	○
sshkey4	expsshkey4	RSA, 2048 bits	○
sshkey5	expsshkey5	RSA, 2048 bits	○

2. Enter the following:

Imported Keys (SSH In)

Host & User Associated with Key

These entries are required in the following cases:

- The imported key file does not contain the host that the user will be making an SSH connection from, or

- The SLC local user login for the connection is different from the user name the key was generated from or is not included in the imported key file, or
- The imported key file contains multiple keys; in this case, each key must include the user name and host at the end of the line in the standard "<key> <user name>@<host>" format.

If either of these conditions is true, or the imported file is in SECSH format, you must specify the user and host. The following is an example of a public key file that includes the user and host:

```
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAEEApUHCX9EWsHt+jmUGXa1YC3us
ABYxIXUhSU1N+NU9HNaUADUFfd8LYz8/gUnUSH4Ksm8GRT7/8/Sn9jCVfGPh
UQ== asallaway@winserver
```

Host	The host name or IP address which will be associated with the SSH Key, typically the host that the key was generated on. Once imported, the key can be used to access the SLC unit from any host, not just the host associated with the key.
User	The User ID of the user being given secure access to the SLC console manager.

Host & Login for Import

Import via	Select **SCP, FTP, HTTPS** and **Copy/Paste as** the method for importing the SSH keys. SCP is the default. If SCP or FTP are selected, theFilename, Host, Path, Login, and Passwordfields are filled in. If HTTPS is selected, theUpload File link will become active to upload a file containing a public key to the SLC. If Copy/Paste is selected, the public key will be entered into the Filename/Public Key field.
Filename/Public Key	The name of the file that was uploaded via HTTPS, or to be copied via SCP or FTP (may contain multiple keys); or the public key (optionally including "user@host" at the end) if Copy/Paste is used.
Host	IP address of the remote server from which to SCP or FTP the public key file.
Path	Optional pathname to the public key file.
Login	User ID to use to SCP or FTP the file.
Password / Retype Password	Password to use to SCP or FTP the file.

Exported Keys (SSH Out)

Export	Enables you to export created public keys. Select one of the following: **New Key for User:** Enables you to create a new key for a user and export the public key in a file. **All Previously Created Keys:** Does not create any keys, but exports all previously created public keys in one file.
User	User ID of the person given secure access to the remote server.
Key Name	Name of the key. This will generate the public key filename (e.g., <keyname>.pub).
Key Type	Select either the **RSA** or the **DSA** encryption standard. **RSA** is the default.
Number of Bits	Select the number of bits in the key (**1024** or **2048**). The default is **1024**.
Passphrase / Retype Passphrase	Optionally, enter a passphrase associated with the key. The passphrase may have up to 50 characters. The passphrase is an optional password that can be associated with an SSH key. It is unique to each user and to each key.
SECSH Format	Indicate whether the keys will be exported in **SECSH** format (by default the key is exported in **OpenSSH** format).
Public Key Filename	Filename of the public host key.

Host and Login for Export

Export via	Select the method (**SCP**, **FTP**, **HTTPS**,or **Cut and Paste**) of exporting the key to the remote server. **Cut and Paste**, the default, requires no other parameters for export.
Host	IP address of the remote server to which the SLC console manager will SCP or FTP the public key file.
Path	Optional path of the file on the host to SCP or FTP the public key too.
Login	User ID to use to SCP or FTP the public key file.
Password / Retype Password	Password to use to SCP or FTP the public key file.

To view or delete a key:

1. Select the key from the appropriate table. The **View** and **Delete** buttons become active.
2. To view the key, click the **View** button. A pop-up page displays the key.

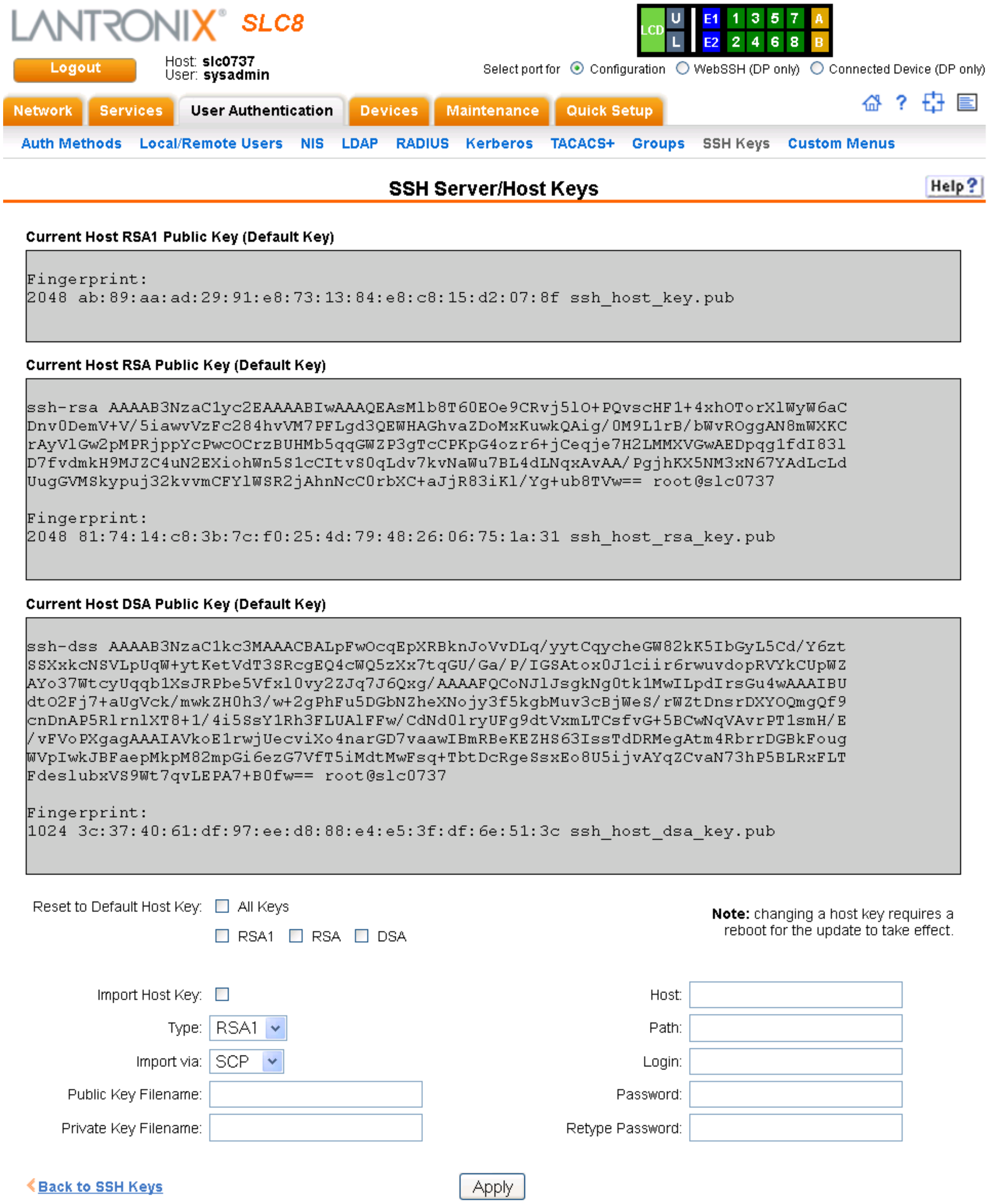
```
Imported key for sysadmin@DaveSLM:
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAIEAxGxPGY9HsG9VqroDo98B89Cf
haqB6jG//0tTMKkb3zrpPu0HHAXaiVXHAvv7lAte31VTpoXdLAXN0uCvuJLf
aL/LvvGmoEWBuBSu505lQHfL70ijxZWOEVTJGFqUQTSq8Ls3/v3lkUJEX5ln
2AlQx0F40I5wNEC0+m3d5QE+FKc= sysadmin@DaveSLM
```

3. To delete the key, click the **Delete** button.

To view, reset, or import SSH RSA1, RSA, And DSA host keys:

1. On the **User Authentication - SSH Keys** page, click the **SSH Server/Host Keys** link at the top right. The following page displays the current host keys. In the example below, the current keys are the defaults.

Figure 12-11 Current Host Keys


LANTRONIX® SLC8
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Logout
Network Services User Authentication Devices Maintenance Quick Setup
Auth Methods Local/Remote Users NIS LDAP RADIUS Kerberos TACACS+ Groups SSH Keys Custom Menus
Help?
Back to SSH Keys
Apply

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

SSH Server/Host Keys

Current Host RSA1 Public Key (Default Key)

```
Fingerprint:
2048 ab:89:aa:ad:29:91:e8:73:13:84:e8:c8:15:d2:07:8f ssh_host_key.pub
```

Current Host RSA Public Key (Default Key)

```
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAQEAsMlb8T60EOe9CRvj5lO+PQvscHF1+4xhOTorXlWyW6aC
Dnv0DemV+V/5iawvVzFc284hvVM7PFLgd3QEWHAGhvaZDoMxKuwkQAig/0M9L1rB/bWvROggAN8mWXKC
rAyVlGw2pMPRjppYcPwcOCrzBUHMb5qqGWZP3gTcCPKpG4ozr6+jCeqje7H2LMMXVGwAEDpqg1fdI83l
D7fvdmkH9MJZC4uN2EXiohWn5S1cCItvS0qLdv7kvNaWu7BL4dLNqxAvAA/PgjhKX5NM3xN67YAdLcLd
UugGVMSkypuj32kvvmCFYlWSR2jAhnNcC0rbXC+aJjR83iKl/Yg+ub8TVw== root@slc0737

Fingerprint:
2048 81:74:14:c8:3b:7c:f0:25:4d:79:48:26:06:75:1a:31 ssh_host_rsa_key.pub
```

Current Host DSA Public Key (Default Key)

```
ssh-dss AAAAB3NzaC1kc3MAAACBALpFwOcqEpXRBknJoVvDLq/yytCqycheGW82kK5IbGyL5Cd/Y6zt
SSXxkcNSVLpUqW+ytKetVdT3SRcgEQ4cWQ5zXx7tqGU/Ga/P/IGSAtox0J1ciir6rwuvdopRVYkCUpWZ
AYo37WtcyUqqb1XsJRPbe5Vfxl0vy2ZJq7J6Qxg/AAAAFQCoNJlJsgkNg0tk1MwILpdIrsGu4wAAAIBU
dtO2Fj7+aUgVck/mwkZH0h3/w+2gPhFu5DGbNZheXNojy3f5kgbMuv3cBjWeS/rWZtDnsrDXYOQmgQf9
cnDnAP5RlrnlXT8+1/4i5SsY1Rh3FLUAlFFw/CdNd0lryUFg9dtVxmLTCsfvG+5BCwNqVAvrPT1smH/E
/vFVoPXgagAAAIAVkoE1rwjUecviXo4narGD7vaawIBmRBeKEZHS63IssTdDRMegAtm4RbrrDGBkFoug
WVpIwkJBFaepMkpM82mpGi6ezG7VfT5iMdtMwFsq+TbtDcRgeSsxEo8U5ijvAYqZCvaN73hP5BLRxFLT
FdeslubxVS9Wt7qvLEPA7+B0fw== root@slc0737

Fingerprint:
1024 3c:37:40:61:df:97:ee:d8:88:e4:e5:3f:df:6e:51:3c ssh_host_dsa_key.pub
```

Reset to Default Host Key: □ All Keys

□ RSA1 □ RSA □ DSA

Note: changing a host key requires a reboot for the update to take effect.

Import Host Key: □

Type: RSA1

Import via: SCP

Public Key Filename:

Private Key Filename:

Host:

Path:

Login:

Password:

Retype Password:

2. View or enter the following:

Reset to Default Host Key	Select the **All Keys** checkbox to reset all default key(s), or select one or more checkboxes to reset defaults for **RSA1**, **RSA**, or **DSA** keys. All checkboxes are unselected by default.
Import Host Key	To import a site-specific host key, select the checkbox. Unselected by default.
Type	From the drop-down list, select the type of host key to import.
Import via	From the drop-down list, select the method of importing the host key (SCP or SFTP). The default is **SCP**.
Public Key Filename	Filename of the public host key.
Private Key Filename	Filename of the private host key.
Host	Host name or IPaddress of the host from which to import the key.
Path	Path of the directory where the host key will be stored.
Login	User ID to use to SCP or SFTP the file.
Password / Retype Password	Password to use to SCP or SFTP the file.

3. Click the **Apply** button.
4. Repeat steps 2-3 for each key you want to import.
5. To return to the SSH Keys page, click the **Back to SSH Keys** link.

SSH Commands

These commands for the command line interface correspond to the web page entries described above.

To import an SSH key:

```
set sshkey import <ftp|scp> <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[path <Path to Public Key File>]
file <Public Key File>
host <IP Address or Name>
login <User Login>
```

To export a key:

```
set sshkey export <ftp|scp|copypaste> <one or more parameters>
```

Parameters:

```
[format <openssh|secsh>]
[host <IP Address or Name>]
[login <User Login>]
[path <Path to Copy Key>]
bits <1024|2048>
keyname <SSH Key Name>
keyuser <SSH Key User>
type <rsa|dsa>
```

To export the public keys of all previously created SSH keys:

```
set sshkey all export <ftp|scp|copypaste> [pubfile <Public Key File>]
[host <IP Address or Name>] [login <User Login>] [path <Path to Copy
Keys>]
```

To delete a key:

```
set sshkey delete <one or more parameters>
```

Parameters:

```
keyhost <SSH Key Host>
keyname <SSH Key Name>
keyuser <SSH Key User>
```

Note: *Specify the key user and key host to delete an imported key; specify the keyuser and keyname to delete an exported key.*

To import an SLC host key or to reset a SLC host key to the default:

```
set sshkey server import type <rsa1|rsa|dsa> via <sftp|scp>
pubfile <Public Key File> privfile <Private Key File>
host <IP Address or Name> login <User Login> [path <Path to Key File>]
```

To reset defaults for all or selected host keys:

```
set sshkey server reset [type <all|rsa1|rsa|dsa>]
```

To display SSH keys that have been imported:

```
show sshkey import <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[viewkey <enable|disable>]
```

To display SSH keys that have been exported:

```
show sshkey export <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[viewkey <enable|disable>]
```

To display host keys (public key only):

```
show sshkey server [type <all|rsa1|rsa|dsa>]
```

1. Click the **Apply** button. New entries display in the Imported SSH Keys table and Exported SSH Keys table, as applicable.

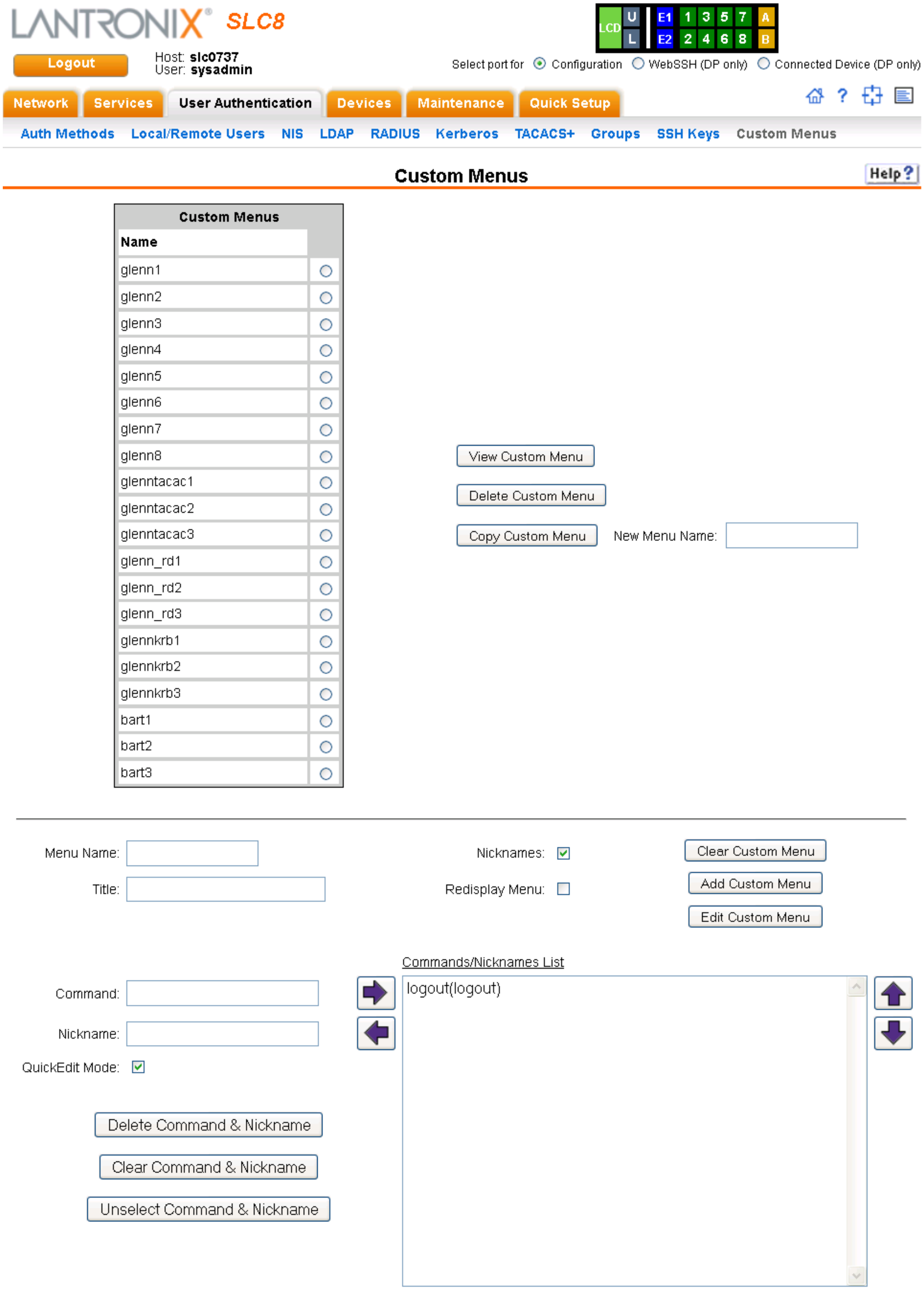
Custom Menus

Users can have custom user menus as their command line interface, rather than the standard CLI command set. Each custom user menu can contain up to 50 commands ('logout' is always the last command). Instead of typing each command, the user enters the number associated with the command. Each command can also have a nickname associated with it, which can be displayed in the menu instead of the command. The commands `showmenu <Menu Name>` and `returnmenu` can be entered to display another menu from a menu, or to return to the prior menu. The command `returncli` can be used to break out of a menu and return to the regular CLI.

To add a custom menu:

1. Click the **User Authentication** tab and select the **Custom Menus** option. The Custom Menus page displays:

Figure 12-12 User Authentication > Custom Menus



Custom Menus

Name	
glenn1	○
glenn2	○
glenn3	○
glenn4	○
glenn5	○
glenn6	○
glenn7	○
glenn8	○
glenntacac1	○
glenntacac2	○
glenntacac3	○
glenn_rd1	○
glenn_rd2	○
glenn_rd3	○
glennkrb1	○
glennkrb2	○
glennkrb3	○
bart1	○
bart2	○
bart3	○

Menu Name:

Title:

Nicknames: ☑

Redisplay Menu: □

Command:

Nickname:

QuickEdit Mode: ☑

Commands/Nicknames List: logout(logout)

2. In the lower section of the page, enter the following:

*Note: To clear fields in the lower part of the page, click the **Clear Custom Menu** button.*

Menu Name	Enter a name for the custom menu.
Title	Enter an optional title which will be displayed about the menu at the CLI.
Nicknames	Select to enable nicknames to be displayed in the menu instead of the commands. If the custom menu will have nicknames, this should also be selected prior to entering the commands in the web page, as this will facilitate entry of the nicknames.
Redisplay Menu	Select to redisplay the custom menu each time before the CLI prompt is displayed.

3. You have the following options:

   - To save the custom menu without any more commands than the default **logout** command, click the **Add Custom Menu** button.

   - To add menu commands, select the **QuickEdit Mode** box. This will move the cursor from **Command** to **Nickname** and back to **Command** (if **Nicknames** is selected), or keep the cursor on Command (if Nicknames is not selected). Commands (and the optional nicknames) are added to the **Menu Commands/Nicknames** list when carriage return is entered at the **Command** field (if **Nicknames** is not selected) or the **Nickname** field (if **Nicknames** is selected). Most browsers have a "Select All" keystroke (such as Control-A) which allow you to select all of the text in a field; this can be used in conjunction with the Delete key to clear the contents of a field before entering a new command or nickname. The **Clear Command & Nickname** button can also be used to delete the contents of the Command and Nickname fields.

     Commands can also be added to the list when **QuickEdit Mode** is not selected. Enter the command and the optional nickname and click the **right** ➡ **arrow**. The command will be added before the logout command (if a command/nickname is not selected in the list) or will replace the currently selected command/nickname in the list. The **Unselect Command & Nickname** button can be used to unselect the currently selected command/nickname in the list.

4. To add more commands to the custom menu, repeat step 3.

5. You also have the following options:

   - To edit a command/nickname in the custom menu, select the command in the **Commands/Nicknames List** box and select the **left** ⬅ **arrow** button. Change the command and/or the nickname, and with the same command still selected in the list, select the **right** ➡ **arrow** button.

   - To remove a command/nickname from the custom menu, select the command in the **Commands/Nicknames List** box and select the **Delete Command & Nickname** button.

   - To move a command higher up in the menu (the commands are shown in the order they will be presented in the custom menu, with command #1 listed first), select the command in the **Commands/Nicknames List** box and click the **up** ⬆ **arrow**.

   - To move a command further down in the menu, select the menu in the **Commands/Nicknames List** and click the **down** ⬇ **arrow**.

6. Click the **Add Custom Menu** button.

To view or update a custom menu:

1. In the **Custom Menus** table, select the custom menu and click the **View Custom Menu** button. The custom menu attributes appear in the lower part of the page.
2. Update the menu attributes following the instructions for adding a menu above.
3. Click the **Edit Custom Menu** button.

To delete a custom menu:

1. Select the custom menu in the **Custom Menus** table.
2. Click the **Delete Custom Menu** button.

To create a new custom menu from an existing custom menu:

1. Select the custom menu in the **Custom Menus** table.
2. Enter a name for the new menu in the **New Menu Name** field.
3. Click the **Copy Custom Menu** button.

Custom User Menu Commands

From the current menu, a user can display another menu, thus allowing menus to be nested. The special command `showmenu <Menu Name>` displays a specified menu. The special command `returnmenu` redisplays the parent menu if the current menu was displayed from a `showmenu` command.

The user with appropriate rights creates and manages custom user menus from the command line interface, but can assign a custom user menu to a user from either the command line or the web interface.

When creating a custom user menu, note the following limitations:

- Maximum of 20 custom user menus
- Maximum of 50 commands per custom user menu (`logout` is always the last command)
- Maximum of 15 characters for menu names
- Maximum of five nested menus can be called.
- No syntax checking (Enter each command correctly.)

To assign a custom user menu to a local or remote user:

```
set localusers add|edit <User Login> menu <Menu Name>
```

To create a new custom user menu or add a command to an existing custom user menu:

```
set menu add <Menu Name> [command <Command Number>]
```

To change a command or nickname within an existing custom user menu:

```
set menu edit <Menu Name> command <Command Number>
set menu edit <Menu Name> nickname <Command Number>
```

To set the optional title for a menu:

```
set menu edit <Menu Name> title <Menu Title>
```

To enable or disable the display of command nicknames instead of commands:

```
set menu edit <Menu Name> shownicknames <enable|disable>
```

To enable or disable the redisplay of the menu before each prompt:

```
set menu edit <Menu Name> redisplaymenu <enable|disable>
```

To delete a custom user menu or one command within a custom user menu:

```
set menu delete <Menu Name> [command <Command Number>]
```

To view a list of all menu names or all commands for a specific menu:

```
show menu <all|Menu Name>
```

Example

The system administrator creates two custom user menus, with menu1 having a nested menu (menu2):

```
[SLC]> set menu add menu1
Enter optional menu title (<return> for none): Menu1 Title
Specify nickname for each command? [no] y
Enter each command, up to 50 commands ('logout' is always the last
command).
Press <return> when the menu command set is complete.
Command  #1: connect direct deviceport 1
Nickname #1: connect Port-1
Command  #2: connect direct deviceport 2
Nickname #2: connect Port-2
Command  #3: showmenu menu2
Warning: menu 'menu2' does not exist.
Nickname #3: menu2
Command  #4:
Command  #4: logout
Nickname #4: log off
Custom User Menu settings successfully updated.
[SLC]> set menu add menu2
Enter optional menu title (<return> for none): Menu2 Title
Specify nickname for each command? [no]
Enter each command, up to 50 commands ('logout' is always the last
command).
Press <return> when the menu command set is complete.
Command  #1: connect direct deviceport 3
Command  #2: connect direct deviceport 4
Command  #3: show datetime
Command  #4: returnmenu
Command  #5:
Command  #5: logout
Custom User Menu settings successfully updated.
[SLC]> show menu all
```

```
___Custom User
Menus___________________________________________________________
menu1             menu2
[SLC]> show menu menu1
___Custom User
Menus___________________________________________________________
Menu: menu1
Title: Menu1 Title
Show Nicknames: enabled
Redisplay Menu: disabled
Command   1: connect direct deviceport 1
Nickname  1: connect Port-1
Command   2: connect direct deviceport 2
Nickname  2: connect Port-2
Command   3: showmenu menu2
Nickname  3: menu2
Command   4: logout
Nickname  4: log off
[SLC]> show menu menu2
_
__Custom User
Menus___________________________________________________________
Menu: menu2
Title: Menu2 Title
Show Nicknames: disabled
Redisplay Menu: disabled
Command   1: connect direct deviceport 3
Nickname  1: <none>
Command   2: connect direct deviceport 4
Nickname  2: <none>
Command   3: show datetime
Nickname  3: <none>
Command   4: returnmenu
Nickname  4: <none>
Command   5: logout
Nickname  5: <none>
```

The system administrator 4 configures local user 'john' to use custom menu 'menu1':

```
[SLC]> set localusers edit john custommenu menu1
Local users settings successfully updated.
[SLC]> show localusers user john
___Current Local Users
Settings________________________________________________
Login: john
    Password: <set>  UID: 101
    Listen Ports: 1-32
    Data Ports: 1-32
    Clear Ports: 1-32
    Escape Sequence: \x1bA  Break Sequence: \x1bB
    Custom Menu: menu1
    Allow Dialback: disabled
    Dialback Number: <none>
```

User 'john ' logs into the command line interface, initially sees menu1, executes the command to jump to nested menu menu2, and then returns to menu1:

```
Welcome to the SLC-Console Server
Model Number: SLC32
For a list of commands, type 'help'.
[Enter 1-4]> help
                                Menu1 Title
------------------------------------------------------------------------
 1) connect Port-1                     3) menu2
 2) connect Port-2                     4) log off
[Enter 1-4]> 3
Executing: showmenu menu2
[Enter 1-5]> help
Menu2 Title
-----------
 1) connect direct deviceport 3
 2) connect direct deviceport 4
 3) show datetime
 4) returnmenu
 5) logout
[Enter 1-5]> 3
Executing: show datetime
Date/Time: Tue Sep  7 19:13:35 2004
Timezone: UTC
[Enter 1-5]> 4
Executing: returnmenu
[Enter 1-4]> help
                                Menu1 Title
------------------------------------------------------------------------
 1) connect Port-1                    3) menu2
 2) connect Port-2                    4) log off
[Enter 1-4]> 4
Executing: logout
Logging out...
```

13: Maintenance

The system administrator performs maintenance activities and operates the SLC using the options for the Maintenance tab and additional commands on the command line interface.

SLC Maintenance

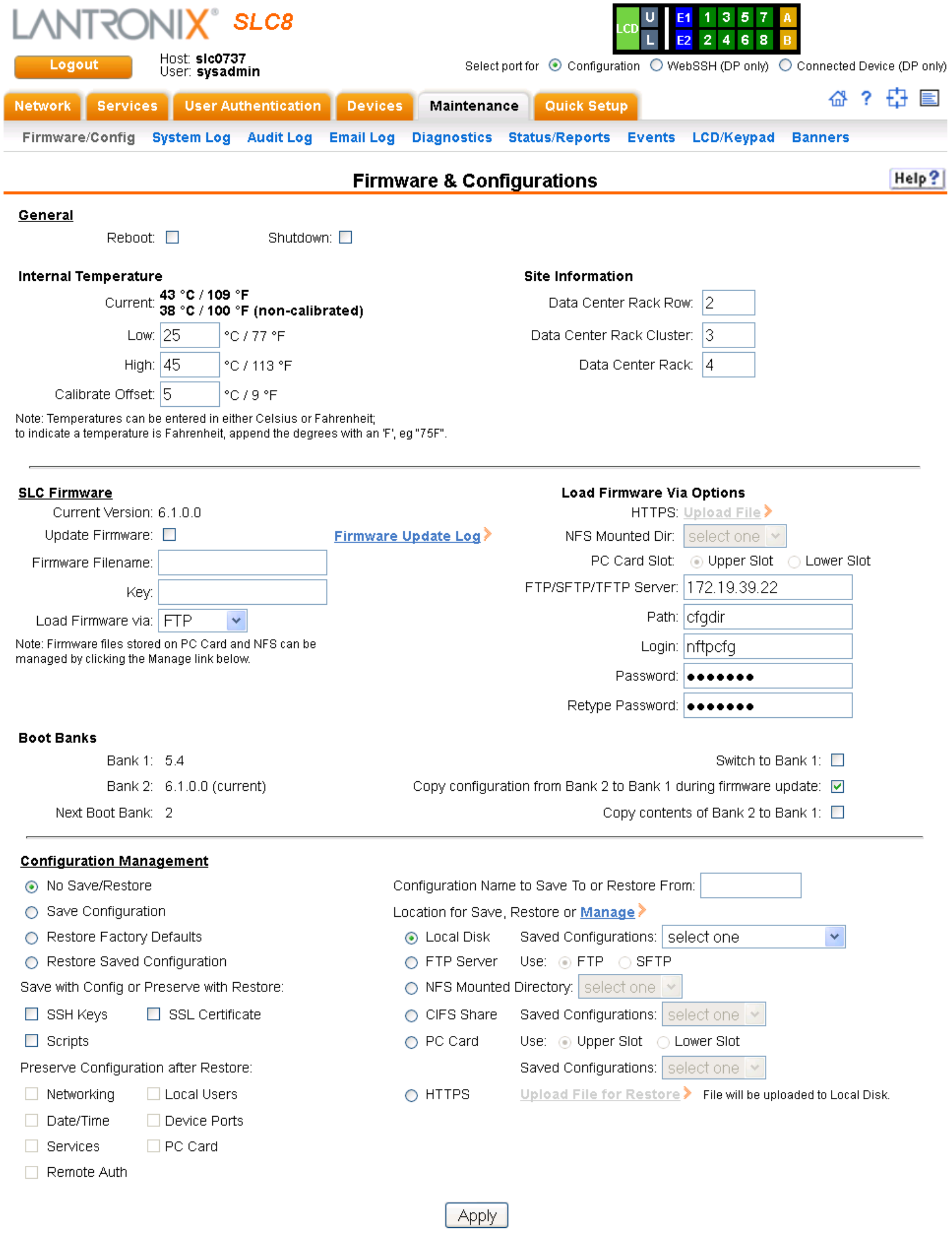
The *Maintenance > Firmware & Config* page allows the system administrator to:

- Configure the FTP, SFTP, or TFTP server that will be used to provide firmware updates and save/restore configurations. (TFTP is only used for firmware updates.)
- Set up the location or method that will be used to save or restore configurations (default, FTP, SFTP, NFS, CIFS, PC card, or USB). Update the version of the firmware running on the SLC console manager .
- Save a snapshot of all settings on the SLC unit (save a configuration).
- Restore the configuration, either to a previously saved configuration, or to the factory defaults.
- View and terminate current web sessions.
- View the firmware version on each boot bank, select the bank to boot from, and copy the contents of one boot bank to the other.

To configure settings:

1. Click the **Maintenance** tab. The *Maintenance > Firmware & Config* page displays.

Figure 13-1 Maintenance > Firmware & Config



LANTRONIX SLC8
Logout
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Network Services User Authentication Devices Maintenance Quick Setup
Firmware/Config System Log Audit Log Email Log Diagnostics Status/Reports Events LCD/Keypad Banners
Help?

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Firmware & Configurations

General

Reboot: □ Shutdown: □

Internal Temperature

Current: 43 °C / 109 °F
38 °C / 100 °F (non-calibrated)

Low: 25 °C / 77 °F

High: 45 °C / 113 °F

Calibrate Offset: 5 °C / 9 °F

Note: Temperatures can be entered in either Celsius or Fahrenheit;
to indicate a temperature is Fahrenheit, append the degrees with an 'F', eg "75F".

Site Information

Data Center Rack Row: 2

Data Center Rack Cluster: 3

Data Center Rack: 4

SLC Firmware

Current Version: 6.1.0.0

Update Firmware: □ Firmware Update Log

Firmware Filename:

Key:

Load Firmware via: FTP

Note: Firmware files stored on PC Card and NFS can be managed by clicking the Manage link below.

Load Firmware Via Options

HTTPS: Upload File

NFS Mounted Dir: select one

PC Card Slot: ● Upper Slot ○ Lower Slot

FTP/SFTP/TFTP Server: 172.19.39.22

Path: cfgdir

Login: nftpcfg

Password: ●●●●●●●

Retype Password: ●●●●●●●

Boot Banks

Bank 1: 5.4

Bank 2: 6.1.0.0 (current)

Next Boot Bank: 2

Switch to Bank 1: □

Copy configuration from Bank 2 to Bank 1 during firmware update: ☑

Copy contents of Bank 2 to Bank 1: □

Configuration Management

● No Save/Restore
○ Save Configuration
○ Restore Factory Defaults
○ Restore Saved Configuration

Save with Config or Preserve with Restore:

□ SSH Keys □ SSL Certificate
□ Scripts

Preserve Configuration after Restore:

□ Networking □ Local Users
□ Date/Time □ Device Ports
□ Services □ PC Card
□ Remote Auth

Configuration Name to Save To or Restore From:

Location for Save, Restore or Manage

● Local Disk Saved Configurations: select one
○ FTP Server Use: ● FTP ○ SFTP
○ NFS Mounted Directory: select one
○ CIFS Share Saved Configurations: select one
○ PC Card Use: ● Upper Slot ○ Lower Slot
Saved Configurations: select one
○ HTTPS Upload File for Restore File will be uploaded to Local Disk.

Apply

2. Enter the following:

Reboot	Select this option to reboot the SLC console manager immediately. The default is **No**. ***Note:*** *The front panel LCD displays the "Rebooting the SLC" message, and the normal boot sequence occurs.*
Shutdown	Select this option to shut down the SLC unit. The default is **No**.

Internal Temperature

Current	Displays current temperature.
Low (°C)	Sets the acceptable minimum for the internal temperature of the SLC console manager. If the temperature of the SLC device changes to be outside of this range, the unit will issue an SNMP trap.
High (°C)	Sets the acceptable maximum for the internal temperature of the SLC device. If the temperature of the SLC unit changes to be outside of this range, the SLC device will issue an SNMP trap.
Calibrate Offset (°C)	An offset for calibrating the internal temperature of the SLC console manager. The offset will be applied one hour after setting the calibration value. Zeroing the offset will take effect immediately and will cancel any current and/or pending calibration.

Site Information

Data Center Rack Row	Set these fields to define the rack row the SLC unit is located within a large data center. The default for these fields is 1.
Data Center Rack Cluster	Set these fields to define the rack cluster the SLC device is located within a large data center. The default for these fields is 1.
Data Center Rack	Set these fields to define the rack the SLC console manager is located within a large data center. The default for these fields is 1.

SLC Firmware

Current Version	Displays the current firmware version.
Update Firmware	◆ To update the SLC firmware, select the checkbox. If you select this option, the SLC unit reboots after you apply the update. The first time boot for each bank may take up to 5 minutes. Subsequent boot times will be approximately 2 minutes. ◆ To view a log of all prior firmware updates, click the **Firmware Update Log** link. ***Note:*** *For dual boot units, the non-active boot bank is updated during the firmware update, without requiring a reboot. The configuration on the current boot bank may optionally be copied to the non-active boot bank during the firmware update.*
Firmware Filename	The name of the firmware update file downloaded from the Lantronix web site.
Key	A key for validating the firmware file. The key is provided with the firmware file (32 hex characters).
Load Firmware via	From the drop-down list, select the method of loading the firmware. Options are **FTP, SFTP, TFTP, HTTP, NFS, USB** and **PC Card**. **FTP** is the default. For **NFS**, the mount directory must be specified. For **PC Card**, the slot must be selected. Connections available depend on the model of the SLB or SLC unit.

Boot Banks

Note: The first time boot for each bank may take up to 5 minutes. Subsequent boot times will be approximately 2 minutes.

Bank 1	Displays the version of SLC firmware in bank 1. *Note: The word "current" displays next to the bank from which the SLC unit booted.*
Bank 2	Displays the version of SLC firmware in bank 2.
Next Boot Bank	Displays the current setting for bank to boot from at next reboot.
Switch to Bank 1	If desired, select the alternate bank to boot from at next reboot.
Copy configuration from Bank 2 to Bank 1 during firmware update	If checked, will copy the configuration from the current bank to the bank being updated. The two numbers are automatically generated so that the first number is the current bank.
Copy contents of Bank 2 to Bank 1	If checked, enables you to copy the current boot bank to the alternate boot bank. This process takes a few minutes to complete.

Load Firmware Via Options

HTTPS	Click on **Upload File** to upload the firmware patch. Enter the key in the Key: field of the main webpage.
NFS Mounted Dir	Select the NFS mounted directory from the drop-down menu.
USB Port	Click to select USB port. USB ports are available on certain models of SLC or SLB units.
PC Card Slot	Click to select the **Upper Slot** or **Lower Slot** if PC Card. PC Cards are available on certain models of SLC or SLB units
FTP/SFTP/TFTP Server	The IP address or host name of the server used for obtaining updates and saving or restoring configurations. May have up to 64 alphanumeric characters; may include hyphens and underscores.
Path	The default path on the server for obtaining firmware update files and getting and putting configuration save files.
Login	The userid for accessing the FTP server. May be blank.
Password / Retype Password	The FTP user password.

Configuration Management

Configuration Management	From the option list, select one of the following: ◆ **No Save/Restore:** Does not save or restore a configuration. ◆ **Save Configuration:** Saves all settings to file, which can be backed up to a location that is not on the SLC unit. ◆ **Restore Factory Defaults:** Restores factory defaults. If you select this option, the SLC console manager reboots after you apply the update. ◆ **Restore Saved Configuration:** Returns the SLC settings to a previously saved configuration. If you select this option, the SLC unit reboots after you apply the update.
Save with Config or Preserve with Restore	◆ Select the **SSH Keys** checkbox to save any imported or exported SSH keys. ◆ Select the **SSL Certificate** checkbox to save an imported certificate. ◆ Select the **Scripts** checkbox to save any interface or batch scripts. Disabled by default.

Preserve Configuration after Restore	Allows the user to keep a subset of the current configuration after restoring a configuration or resetting to factory defaults. Select the checkbox for each part of the current configuration you want to keep, for example, Networking, Services, or Device Ports.
Configuration Name to Save to or Restore From	If you selected to save or restore a configuration, enter a name for the configuration file (up to 12 characters).
Location for Save, Restore, or Manage	If you selected to save or restore a configuration, select one of the following options: ◆ **Local Disk – Saved Configurations:** If restoring, select a saved configuration from the drop-down list. ◆ **FTP Server:** The FTP server specified in the FTP/SFTP/TFTP section. If you select this option, select **FTP** or **SFTP** to transfer the configuration file. ◆ **NFS Mounted Directory:** Local directory of the NFS server for mounting files. ◆ **CIFS Share – Saved Configurations:** If restoring, select a saved configuration from the drop-down list. ◆ **USB:** If a USB thumb drive is loaded into one of the USB ports of the SLC unit, and properly mounted, the configuration can be saved to or restored from this location.If you select this option, select the port in which the USB thumb drive is mounted; then click a saved configuration from the drop-down list. This option is available on some SLC and SLB units. ◆ **PC Card:** If a PC Card Compact Flash is loaded into one of the PC card slots of the SLC or SLB unit, and properly mounted, the configuration can be saved to or restored from this location. PC card slots are available for certain models of SLC and SLB units. If you select this option, select the slot in which the PC card compact flash is mounted; then click a saved configuration from the drop-down list. This option is available on some SLC and SLB units. ◆ **HTTPS:** For saving, the browser will prompt the user to save the configuration. For restoring, the configuration will be uploaded to the Local Disk location. ◆ **Manage:** The **Manage** option allows you to view and delete all configurations saved to the selected location. This feature is available for the default, CIFS Share, PC Card and USB locations.

3. Click **Apply**.

Note: *If you selected an option that forces a reboot (restore configuration, update firmware, or reset factory defaults), the SLC console manager automatically reboots at the end of the process.*

To set the acceptable range for the internal temperature sensor (an SNMP trap is sent if the temperature is outside of this range):

```
set temperature <one or more parameters>
```

Parameters:

```
low <Low Temperature in C.>
high <High Temperature in C.>
calibrate <Temperature Calibration in C.>
```

Note: *the calibration offset will be applied one hour after setting the value.*

To display the acceptable range and the current reading from the internal temperature sensor:

```
show temperature
```

To set the acceptable range for the internal temperature sensor (an SNMP trap is sent if the temperature is outside of this range):

```
set temperature <one or more parameters>
```

Parameters:

```
low <Low Temperature in C. or F.>
high <High Temperature in C. or F.>
calibrate <Temperature Calibration in C. or F.|cancel>
```

Note: *the calibration offset will be applied one hour after setting the value.*

To display the acceptable range and the current reading from the internal temperature sensor:

```
show temperature
```

To save the current SLC configuration to a selected location:

```
admin config save <Config Name> location
     <local|ftp|sftp|nfs|cifs|usb|pccard>
     [nfsdir <NFS Mounted Directory>] [usbport <U1>]
     [pccardslot <upper|lower>]
     [savesshkeys <enable|disable>] [savesslcert <enable|disable>]
     [savescripts <enable|disable>]
```

To restore a saved configuration to the SLC:

```
admin config restore <Config Name> location
<local|ftp|sftp|nfs|cifs|usb|pccard>
     [nfsdir <NFS Mounted Directory>] [usbport <U1>]
     [pccardslot <upper|lower>]
     [savesshkeys <enable|disable>] [savesslcert <enable|disable>]
     [savescripts <enable|disable>]
     [preserveconfig <Config Params to Preserve>]
```

To restore the SLC to factory default settings:

```
admin config factorydefaults [savesshkeys <enable|disable>]
     [savesslcert <enable|disable>] [savescripts <enable|disable>]
     [preserveconfig <Config Params to Preserve>]
```

`<Config Params to Preserve>` is a comma separated list of current configuration parameters to retain after the config restore or factorydefaults:

```
  nt - Networking                    ra - Remote Authentication
  sv - Services                      dp - Device Ports
  dt - Date/Time                     ub - USB / pc - PC Card
  lu - Local Users
```

To delete or rename a configuration (the user is prompted for the new name for renames):

```
admin config rename|delete <Config Name> location
     <local|nfs|cifs|usb|pccard>
     [nfsdir <NFS Mounted Directory>] [usbport <U1>]
     [pccardslot <upper|lower>]
```

To copy the current configuration (or optionally, a configuration from another location) to the other bank (for dual-boot SLB/SLC units):

```
admin config copy <current|Config Name>
     [location <local|nfs|cifs|usb|pccard>
     [nfsdir <NFS Mounted Directory>] [usbport <U1>]
     [pccardslot <upper|lower>]
```

To list the configurations saved to a location:

```
admin config show <local|ftp|sftp|nfs|cifs|usb|pccard>
     [nfsdir <NFS Mounted Directory>] [usbport <U1>]
     [pccardslot <upper|lower>]
```

Note: A reboot will automatically be done after a successful config restore or factory defaults.

To update the SLB/SLC firmware to a new revision (the firmware file should be accessible via the settings displayed by 'admin ftp show'):

```
admin firmware update <ftp|tftp|sftp|nfs|usb|pccard> file
     <Firmware File> key <Checksum Key>
     [nfsdir <NFS Mounted Directory>]
     [usbport <U1>] [pccardslot <upper|lower>]
```

To set the boot bank to be used at the next SLB/SLC reboot (for dual-boot SLB/SLC units):

```
admin firmware bootbank <1|2>
```

To copy the boot bank from the currently booted bank to the alternate bank (for dual-boot SLB/SLC units):

```
admin firmware copybank
```

To list the current firmware revision, the boot bank status (for dual-boot SLB/SLC units), and optionally displays the log containing details about firmware updates:

```
admin firmware show [viewlog <enable|disable>]
```

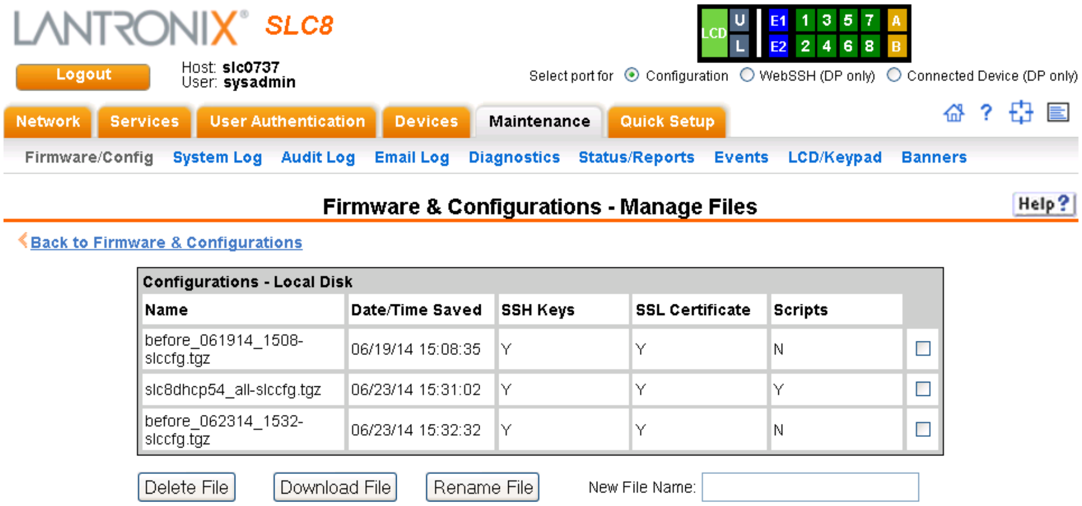
Note: A reboot will automatically be done after a successful firmware update.

To manage configuration files:

The Manage option on the *Maintenance > Firmware & Config* page allows you to view all configurations saved to the selected location and delete any of the configurations. This feature is available for the default, CIFS Share, and USB locations.

1. On the *Maintenance > Firmware & Config* page, click the **Manage** link. The following page displays the name and the time and date the file was saved:

Figure 13-2 Manage Configuration Files


LANTRONIX SLC8
Logout
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Network Services User Authentication Devices Maintenance Quick Setup
Firmware/Config System Log Audit Log Email Log Diagnostics Status/Reports Events LCD/Keypad Banners
Help?
Back to Firmware & Configurations
Delete File
Download File
Rename File

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Firmware & Configurations - Manage Files

Configurations - Local Disk

Name	Date/Time Saved	SSH Keys	SSL Certificate	Scripts	
before_061914_1508-slccfg.tgz	06/19/14 15:08:35	Y	Y	N	□
slc8dhcp54_all-slccfg.tgz	06/23/14 15:31:02	Y	Y	Y	□
before_062314_1532-slccfg.tgz	06/23/14 15:32:32	Y	Y	N	□

New File Name:

2. To delete files, select one or more files and click the **Delete File** button.
3. To download a new firmware file, click the **Delete File** button.
4. To rename a listed file, select the file, type the new file name into the **New File Name** field, and click the **Rename File** button.

Administrative Commands

These commands for the command line interface correspond to the web page entries described above.

To copy the boot bank from the currently booted bank to the alternate bank (for dual-boot SLB/SLC units):

```
admin firmware copybank
```

To reboot the SLC:

```
admin reboot
```

Note: The front panel LCD displays the "Rebooting the SLC" message, and the normal boot sequence occurs.

To prepare the SLC console manager to be powered off:

```
admin shutdown
```

Note: When you use this command to shut down the SLC unit, the LCD front panel displays "Shutting down the SLC console manager," followed by a pause, and then "Shutdown complete." When "Shutdown complete" displays, it is safe to power off the SLC unit. This command is not available on the web page.

To list current hardware and firmware information:

```
admin version
```

To update SLC firmware to a new revision:

Note: The firmware file should be accessible via the settings displayed by admin ftp show. The SLC console manager automatically reboots after successful update.

```
admin firmware update <ftp|tftp|sftp|nfs|pccard|usb> file
      <Firmware File> key <Checksum Key>
      [nfsdir <NFS Mounted Directory>] [usbport <U1>]
      [pccardslot <upper|lower>]
```

To set the boot bank to be used at the next SLC unit reboot:

```
admin firmware bootbank <1|2>
```

Applies to dual-boot SLB/SLC units only

To list the current firmware revision:

```
admin firmware show [viewlog <enable|disable>]
```

Lists the current firmware revision, the boot bank status (for dual-boot SLB/SLC units), and optionally displays the log containing details about firmware updates

To set the FTP/TFTP/SFTP server used for firmware updates and configuration save/restore:

```
admin ftp server <IP Address or Hostname> [login <User Login>] [path
<Directory>]
```

To view FTP settings:

```
admin ftp show
```

To set the FTP server password and prevent it from being echoed:

```
admin ftp password
```

To restore the SLC console manager to factory default settings:

```
admin config factorydefaults [savesshkeys <enable|disable>] [savesslcert
<enable|disable>][preserveconfig <Config Params to Preserve>]
```

`<Config Params to Preserve>` is a comma-separated list of current configuration parameters to retain after the config restore or factorydefaults:

```
nt – Networking                  ra - Remote Authentication
sv – Services                    dp – Device Ports
dt – Date/Time                   ub - USB
lu –  Local Users
```

To restore a saved configuration to the SLC unit:

```
admin config restore <Config Name> location <default|ftp|sftp|nfs|cifs|>
[nfsdir <NFS Mounted Dir>] [ <>] [keepconfig <Config Params to Keep>]

[preserveconfig <Config Params to Prserve>]
```

`<Config Params to Preserve>` is a comma-separated list of current configuration parameters to retain after the config restore or factory defaults:

```
nt – Networking                   ra - Remote Authentication
sv – Services                     dp – Device Ports
dt – Date/Time                    ub - USB
lu –  Local Users
```

To save the current SLC configuration to a selected location:

```
admin config save <Config Name> location
      <default|ftp|sftp|nfs|cifs|usb|pccard> [nfsdir <NFS Mounted Dir>]
      [usbport <u1>] [pccardslot <upper|lower>]
```

To delete a saved configuration:

```
admin config delete <Config Name> location <default|cifs|usb>
      [usbport <u1>] [pccardslot <upper|lower>]
```

To list the configurations saved to a location:

```
admin config show <default|ftp|sftp|nfs|cifs|usb|pccard>
      [nfsdir <NFS Mounted Dir>] [usbport <u1>]
      [pccardslot <upper|lower>]
```

To run the quick setup script:

```
admin quicksetup
```

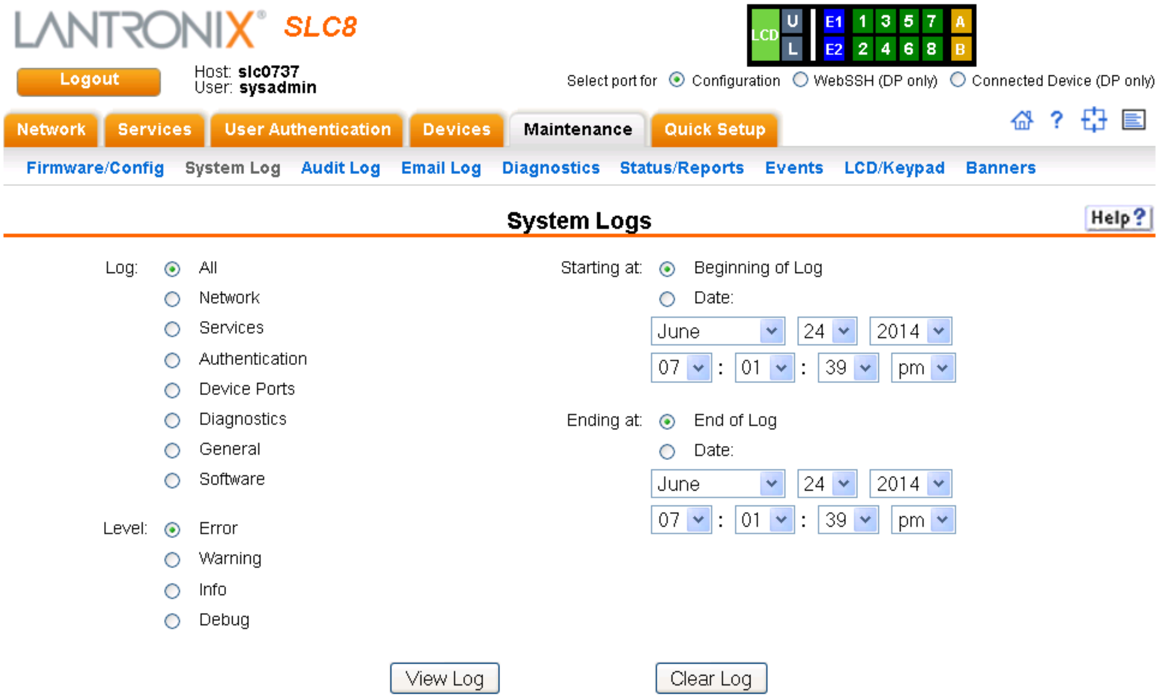
System Logs

The *Maintenance > System Logs* page allows you to view various system logs. (See *Chapter 7: Services on page 68* for more information about system logs.) You can also clear logs on this page.

To view system logs:

1. Click the **Maintenance** tab and select the **System Logs** option. The following page displays:

Figure 13-3 Maintenance > System Logs



LANTRONIX SLC8
Logout
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Network Services User Authentication Devices Maintenance Quick Setup
Firmware/Config System Log Audit Log Email Log Diagnostics Status/Reports Events LCD/Keypad Banners
Help?
View Log
Clear Log

Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

System Logs

Log: ● All ○ Network ○ Services ○ Authentication ○ Device Ports ○ Diagnostics ○ General ○ Software

Level: ● Error ○ Warning ○ Info ○ Debug

Starting at: ● Beginning of Log ○ Date: June 24 2014 07 : 01 : 39 pm

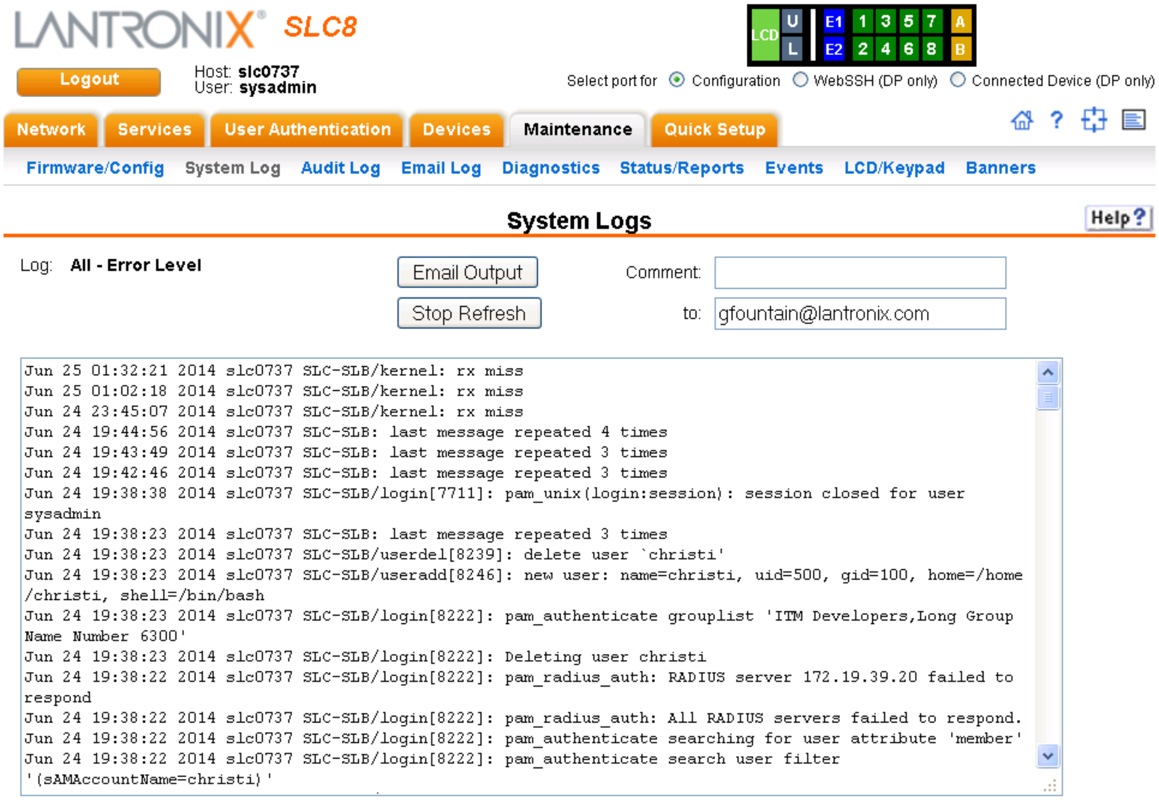
Ending at: ● End of Log ○ Date: June 24 2014 07 : 01 : 39 pm

2. Enter the following to define the parameters of the log you would like to view:

Log	Select the type(s) of log you want to view: ◆ All ◆ Network ◆ Services ◆ Authentication ◆ Device Ports ◆ Diagnostics ◆ General ◆ Software
Level	Select the alert level you want to view for the selected log: ◆ Error ◆ Warning ◆ Info ◆ Debug
Starting at	Select the starting point of the range you want to view: ◆ **Beginning of Log:** to view the log from the earliest available beginning time and date. ◆ **Date:** to view the log starting from aspecific starting date and time.
Ending at	Select the endpoint of the range you want to view: ◆ **End of Log:** to view the log from the latest available ending time and date. ◆ **Date:** to view the log up to the last available log ending date and time.

3. Click the **View Log** button. Your specified system log displays. For example, if you select the type **All** and the level **Error**, the SLC console manager displays a log similar to this:

Figure 13-4 System Logs



System Logs

Log: **All - Error Level**

Comment:

to: gfountain@lantronix.com

```
Jun 25 01:32:21 2014 slc0737 SLC-SLB/kernel: rx miss
Jun 25 01:02:18 2014 slc0737 SLC-SLB/kernel: rx miss
Jun 24 23:45:07 2014 slc0737 SLC-SLB/kernel: rx miss
Jun 24 19:44:56 2014 slc0737 SLC-SLB: last message repeated 4 times
Jun 24 19:43:49 2014 slc0737 SLC-SLB: last message repeated 3 times
Jun 24 19:42:46 2014 slc0737 SLC-SLB: last message repeated 3 times
Jun 24 19:38:38 2014 slc0737 SLC-SLB/login[7711]: pam_unix(login:session): session closed for user
sysadmin
Jun 24 19:38:23 2014 slc0737 SLC-SLB: last message repeated 3 times
Jun 24 19:38:23 2014 slc0737 SLC-SLB/userdel[8239]: delete user `christi'
Jun 24 19:38:23 2014 slc0737 SLC-SLB/useradd[8246]: new user: name=christi, uid=500, gid=100, home=/home
/christi, shell=/bin/bash
Jun 24 19:38:23 2014 slc0737 SLC-SLB/login[8222]: pam_authenticate grouplist 'ITM Developers,Long Group
Name Number 6300'
Jun 24 19:38:23 2014 slc0737 SLC-SLB/login[8222]: Deleting user christi
Jun 24 19:38:22 2014 slc0737 SLC-SLB/login[8222]: pam_radius_auth: RADIUS server 172.19.39.20 failed to
respond
Jun 24 19:38:22 2014 slc0737 SLC-SLB/login[8222]: pam_radius_auth: All RADIUS servers failed to respond.
Jun 24 19:38:22 2014 slc0737 SLC-SLB/login[8222]: pam_authenticate searching for user attribute 'member'
Jun 24 19:38:22 2014 slc0737 SLC-SLB/login[8222]: pam_authenticate search user filter
'(sAMAccountName=christi)'
```

From a queried system log (i.e., *Figure 13-4*), you may email this information to a specific individual or to Lantronix Technical Support. See *Emailing Logs and Reports (on page 236)*.

To clear system logs:

1. From the *Maintenance > System Logs* page, select **SLC Maintenance - System Logs**.
2. Click the **Clear Log** button to clear all log information.

System Log Command

The following command for the command line interface corresponds to the web page entries described above.

To view the system logs containing information and error messages:

show syslog [<parameters>]

Parameters:

```
[email <Email Address>]
level <error|warning|info|debug>
log <all|netlog|servlog|authlog|devlog|diaglog|genlog>
display <head|tail> [numlines <Number of Lines>]
startingtime <MMDDYYhhmm [ss]
endtime <MMDDYYhhmm [ss]
```

Note: The level and time parameters cannot be used simultaneously.

To clear one or all of the system logs:

```
show syslog clear
<all|netlog|servlog|authlog|devlog|diaglog|genlog>
```

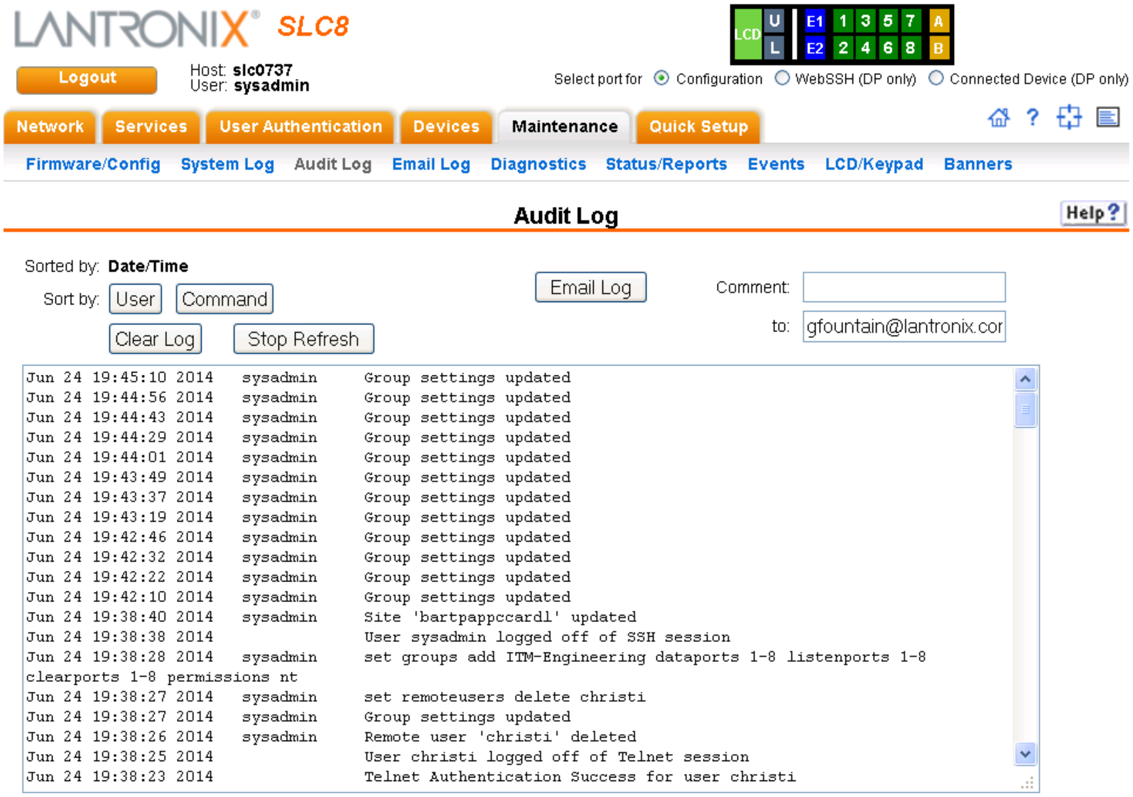
Audit Log

The *Maintenance > Audit Log* page displays a log of all actions that have changed the configuration of the SLC console manager. The audit log is disabled by default. Use the *Services > SSH/Telnet/Logging* page (*Chapter 7: Services*) to enable the audit log and to configure its maximum size.

Each entry in the log file contains a date/time stamp, user login, and the action performed by the user. The user may clear the log file and sort the log by date/time, user, and command. The audit log is saved through SLC unit reboots.

1. Click the **Maintenance** tab and select the **Audit Log** option. The following page displays:

Figure 13-5 Maintenance > Audit Log



Host: slc0737
User: sysadmin

Audit Log

Sorted by: Date/Time

Comment:

to: gfountain@lantronix.cor

```
Jun 24 19:45:10 2014   sysadmin     Group settings updated
Jun 24 19:44:56 2014   sysadmin     Group settings updated
Jun 24 19:44:43 2014   sysadmin     Group settings updated
Jun 24 19:44:29 2014   sysadmin     Group settings updated
Jun 24 19:44:01 2014   sysadmin     Group settings updated
Jun 24 19:43:49 2014   sysadmin     Group settings updated
Jun 24 19:43:37 2014   sysadmin     Group settings updated
Jun 24 19:43:19 2014   sysadmin     Group settings updated
Jun 24 19:42:46 2014   sysadmin     Group settings updated
Jun 24 19:42:32 2014   sysadmin     Group settings updated
Jun 24 19:42:22 2014   sysadmin     Group settings updated
Jun 24 19:42:10 2014   sysadmin     Group settings updated
Jun 24 19:38:40 2014   sysadmin     Site 'bartpappccardl' updated
Jun 24 19:38:38 2014                User sysadmin logged off of SSH session
Jun 24 19:38:28 2014   sysadmin     set groups add ITM-Engineering dataports 1-8 listenports 1-8
clearports 1-8 permissions nt
Jun 24 19:38:27 2014   sysadmin     set remoteusers delete christi
Jun 24 19:38:27 2014   sysadmin     Group settings updated
Jun 24 19:38:26 2014   sysadmin     Remote user 'christi' deleted
Jun 24 19:38:25 2014                User christi logged off of Telnet session
Jun 24 19:38:23 2014                Telnet Authentication Success for user christi
```

2. To select a sort option, click the appropriate button:
   - To sort by date and time, click the S**ort by Date/Time** button (this is the default.)
   - To sort by user, click the Sort by **User** button.
   - To sort by command/action, click the **Command** button.
3. To email this log, follow the instructions in *Emailing Logs and Reports (on page 236)*.

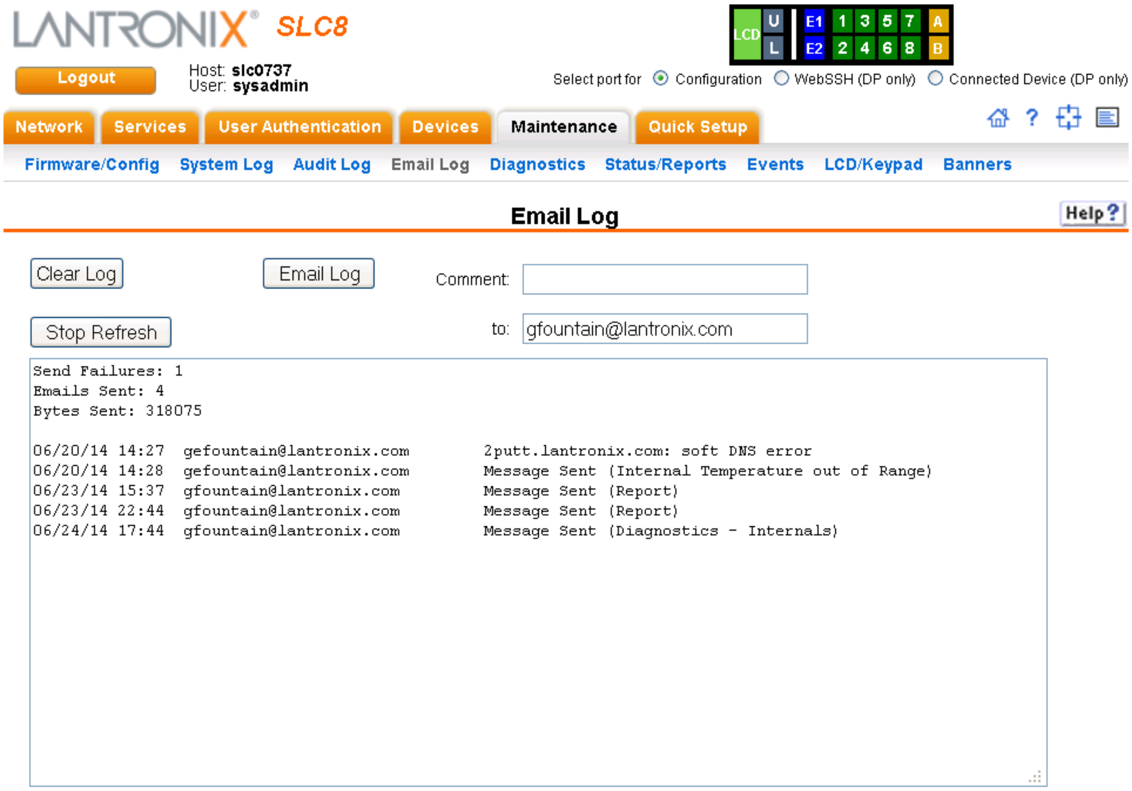
4. To clear the log, click the **Clear Log** button.
5. To freeze or stop automatic refreshing of the log, click the **Stop Refresh** button.

Email Log

The *Maintenance > Email Log* page displays a log of all attempted emails. The log file can be cleared from here. The email log is saved through SLC unit reboots.

1. Click the Maintenance tab and select the Email Log option. The following page displays:

Figure 13-6 Maintenance > Email Log



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Email Log

Comment:

to: gfountain@lantronix.com

```
Send Failures: 1
Emails Sent: 4
Bytes Sent: 318075

06/20/14 14:27  gefountain@lantronix.com        2putt.lantronix.com: soft DNS error
06/20/14 14:28  gefountain@lantronix.com        Message Sent (Internal Temperature out of Range)
06/23/14 15:37  gfountain@lantronix.com         Message Sent (Report)
06/23/14 22:44  gfountain@lantronix.com         Message Sent (Report)
06/24/14 17:44  gfountain@lantronix.com         Message Sent (Diagnostics - Internals)
```

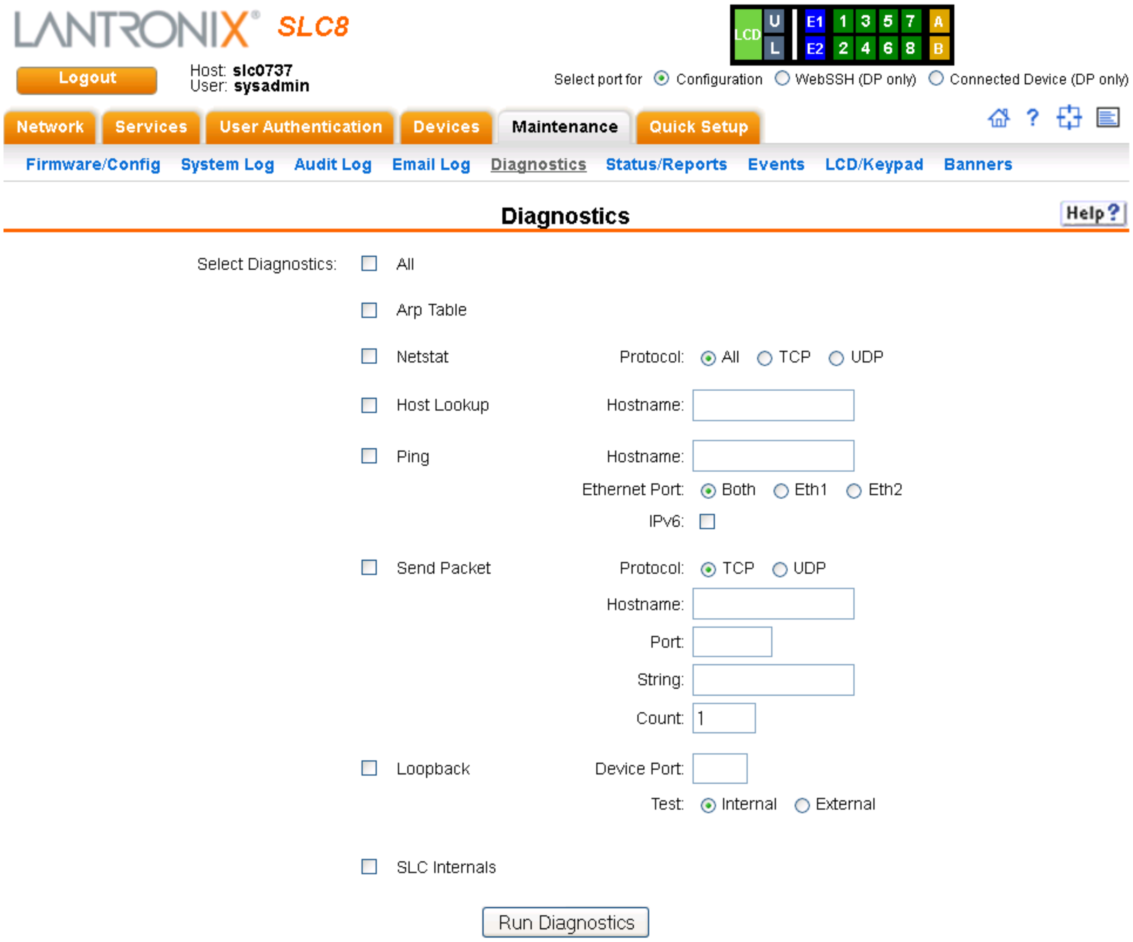
2. To email this log, follow the instructions in *Emailing Logs and Reports (on page 236)*.
3. To clear the log, click the **Clear Log** button.

Diagnostics

The *Maintenance > Diagnostics* page provides methods for diagnosing problems such as network connectivity and device port input/output problems. You can use equivalent commands on the command line interface. An additional diagnostic, loopback, is only available as a command.

1. Click the **Maintenance** tab and select the **Diagnostics** option. The following page displays:

Figure 13-7 Maintenance > Diagnostics



Diagnostics

Select Diagnostics: □ All

□ Arp Table

□ Netstat — Protocol: ● All ○ TCP ○ UDP

□ Host Lookup — Hostname:

□ Ping — Hostname:
Ethernet Port: ● Both ○ Eth1 ○ Eth2
IPv6: □

□ Send Packet — Protocol: ● TCP ○ UDP
Hostname:
Port:
String:
Count: 1

□ Loopback — Device Port:
Test: ● Internal ○ External

□ SLC Internals

Run Diagnostics

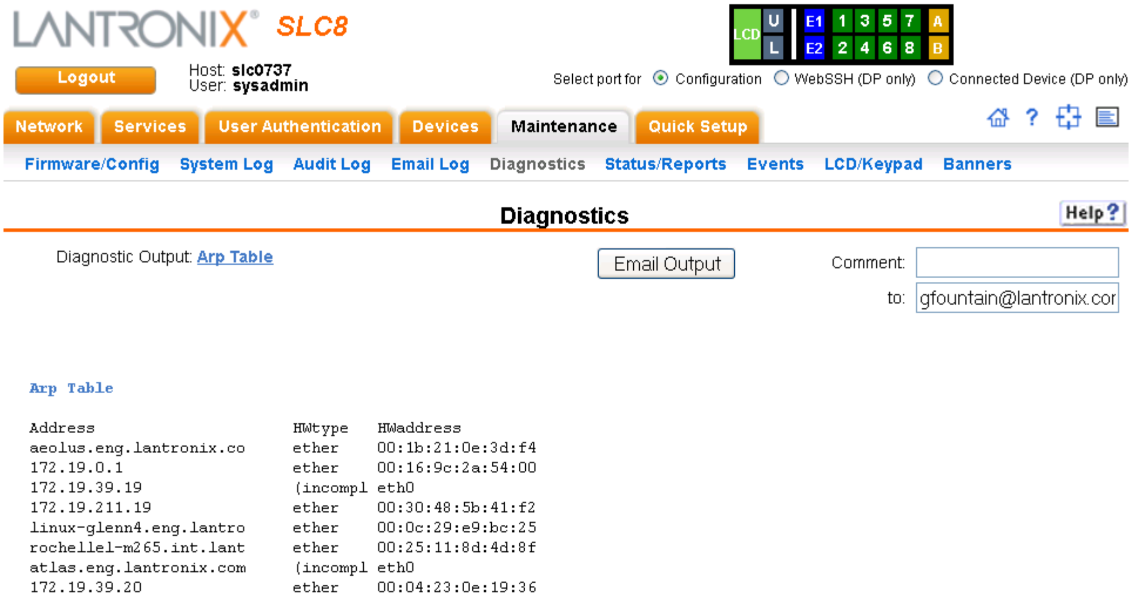
2. Select **Diagnostics** from checklist (one or more diagnostic methods you want to run, or select All to run them all):

ARP Table	Address Resolution Protocol (ARP) table used to view the IP address-to-hardware address mapping.
Netstat	Displays network connections. If you select the checkbox, select the **TCP** or **UDP** protocol, or select **All** for both protocols to control the output of the Netstat report.
Host Lookup	Select to verify that the SLC console manager can resolve the host name into an IP address (if DNS is enabled). If selected, also enter a host name in the corresponding Hostname field,

Ping	Select to verify that the host is up and running. If selected, also do the following: ◆ Enter a host name in the corresponding **Hostname** field ◆ Specify Ethernet Port (Both, Eth1 or Eth2) ◆ Check IPv6 if... need text.
Send Packet	This option sends an Ethernet packet out one of the Ethernet ports, mainly as a network connectivity test. For UDP, the number of times the string is sent is equal to the number of packets sent. For TCP, the number of times the string is sent may (or may not) be equal to the number of packets sent, because TCP controls how data is packetized and sent out. Enter the following: ◆ **Protocol:** Select the type of packet to send (**TCP** or **UDP**). ◆ **Hostname:** Specify a host name or IPaddress of the host to send the packet to. ◆ **Port:** Specify a **TCP** or **UDP** port number of the host to send the packet to. ◆ **String:** Enter a set of up to 64 characters. The string is encapsulated in the packet (so you could use a network sniffer to track the packet and, by looking at its contents, verify that it was sent). ◆ **Count:** The count is the number of times the string is sent.
Loopback	Specify loopback information: ◆ **Device Port** ◆ Select either an **Internal** or **External** test
SLC Internals	Select to display information on the internal memory, storage and processes of the SLC unit.

3. Click the **Run Diagnostics** button. The *Diagnostics Report* page displays.

Figure 13-8 Diagnostics Report



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Diagnostics

Diagnostic Output: Arp Table

Comment:

to: gfountain@lantronix.cor

```
Arp Table

Address                  HWtype   HWaddress
aeolus.eng.lantronix.co  ether    00:1b:21:0e:3d:f4
172.19.0.1               ether    00:16:9c:2a:54:00
172.19.39.19             (incompl eth0
172.19.211.19            ether    00:30:48:5b:41:f2
linux-glenn4.eng.lantro  ether    00:0c:29:e9:bc:25
rochellel-m265.int.lant  ether    00:25:11:8d:4d:8f
atlas.eng.lantronix.com  (incompl eth0
172.19.39.20             ether    00:04:23:0e:19:36
```

4. To email this report, follow the instructions in *Emailing Logs and Reports (on page 236)*.

Diagnostic Commands

The following CLI commands correspond to the web page entries described above.

To display the ARP table of IP address-to-hardware address mapping:

```
diag arp [email <Email Address>]
```

You can optionally email the displayed information.

To display a report of network connections:

```
diag netstat [protocol <all|tcp|udp>] [email <Email Address>]
```

You can optionally email the displayed information.

To resolve a host name into an IP address:

```
diag lookup <Hostname> [email <Email Address>]
```

You can optionally email the displayed information.

To test a device port by transmitting data out the port and verifying that it is received correctly:

```
diag loopback <Device Port Number or Name>[<parameters>]
```

Parameters:

```
test <internal|external>
xferdatasize <Size In Kbytes to Transfer>
```

Default is 1 Kbyte.

Note: A special loopback cable comes with the SLC unit. To test a device port, plug the cable into the device port and run this command. The command sends the specified Kbytes to the device port and reports success or failure. The test is performed at 9600 baud. Only an external test requires a loopback cable.

To display the route that packets take to get to a network host:

```
diag traceroute <IP Address or Hostname>
```

To verify that the host is up and running:

```
diag ping <IP Address or Name> [<parameters>]
```

Parameters:

```
count <Number of Times to Ping>
```

The default is 5.

```
packetsize <Size in Bytes>
```

The default is 64.

To display performance statistics for an Ethernet port or a device port (averaged over the last 5 seconds):

```
diag perfstat [ethport <1|2>] [deviceport <Device Port # or Name>]
```

To generate and send Ethernet packets:

```
diag sendpacket host <IP Address or Name> port <TCP or UDP Port Number>
[string <Packet String>] [protocol <tcp|udp>] [count <Number of
Packets>]
```

```
The default is 1.
```

To display all network traffic, applying optional filters:

Note: *This command is not available on the web interface.*

```
diag nettrace <one or more parameters>
Parameters:
ethport <1|2>
host <IP Address or Name>
numpackets <Number of Packets>
protocol <tcp|udp|icmp>
verbose <enable|disable>
```

To display information on the internal memory, storage and processes of the SLC unit:

```
diag internals [email <Email Address>]
```

Note: *This command is available the web interface as SLC Internals under **Maintenance > Diagnostics**.*

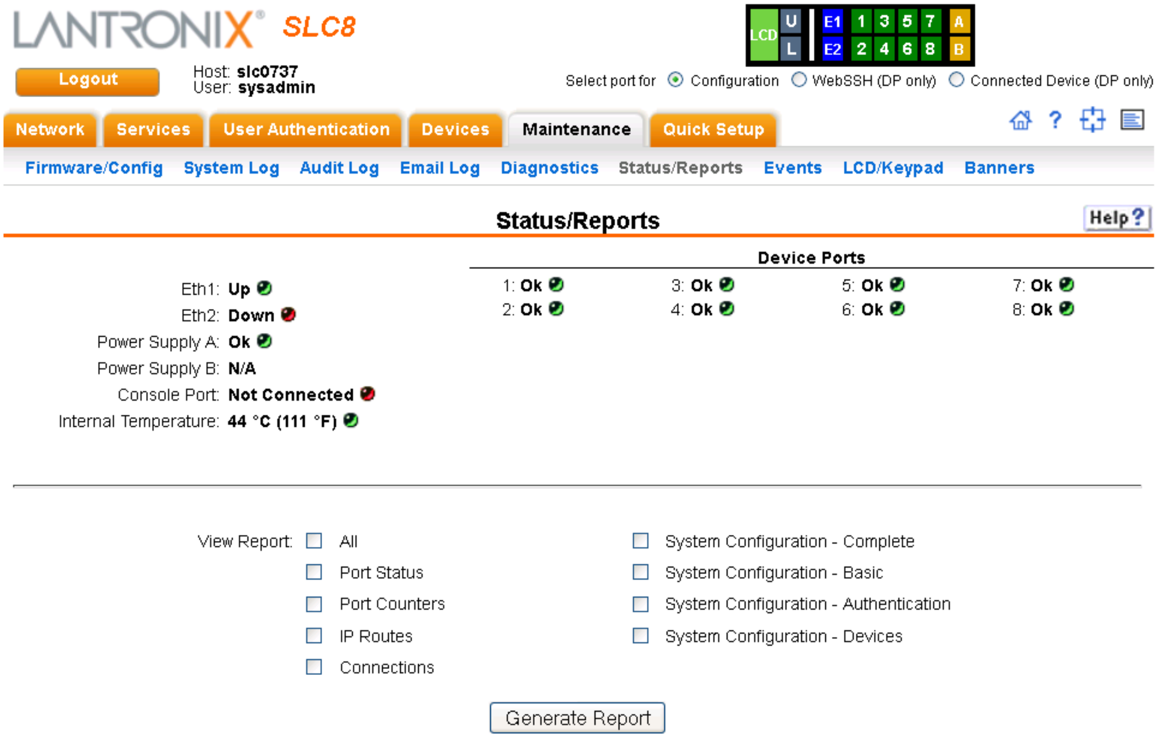
Status/Reports

On this page, you can view the status of the SLC ports and power supplies and generate a selection of reports.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, you must reload the web page.*

1. Click the **Maintenance** tab and select the **Status/Reports** option. The following page displays:

Figure 13-9 Maintenance > Status/Reports



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Status/Reports

Eth1: Up ●
Eth2: Down ●
Power Supply A: Ok ●
Power Supply B: N/A
Console Port: Not Connected ●
Internal Temperature: 44 °C (111 °F) ●

Device Ports

1: Ok ●	3: Ok ●	5: Ok ●	7: Ok ●
2: Ok ●	4: Ok ●	6: Ok ●	8: Ok ●

View Report:
□ All
□ Port Status
□ Port Counters
□ IP Routes
□ Connections
□ System Configuration - Complete
□ System Configuration - Basic
□ System Configuration - Authentication
□ System Configuration - Devices

The top half of the page displays the status of each port, power supply, and power outlet:

- **Green** indicates that the port connection or power supply is active and functioning correctly.
- **Red** indicates an error or failure or that the device is off.

2. Select the desired reports to view under **View Report**:

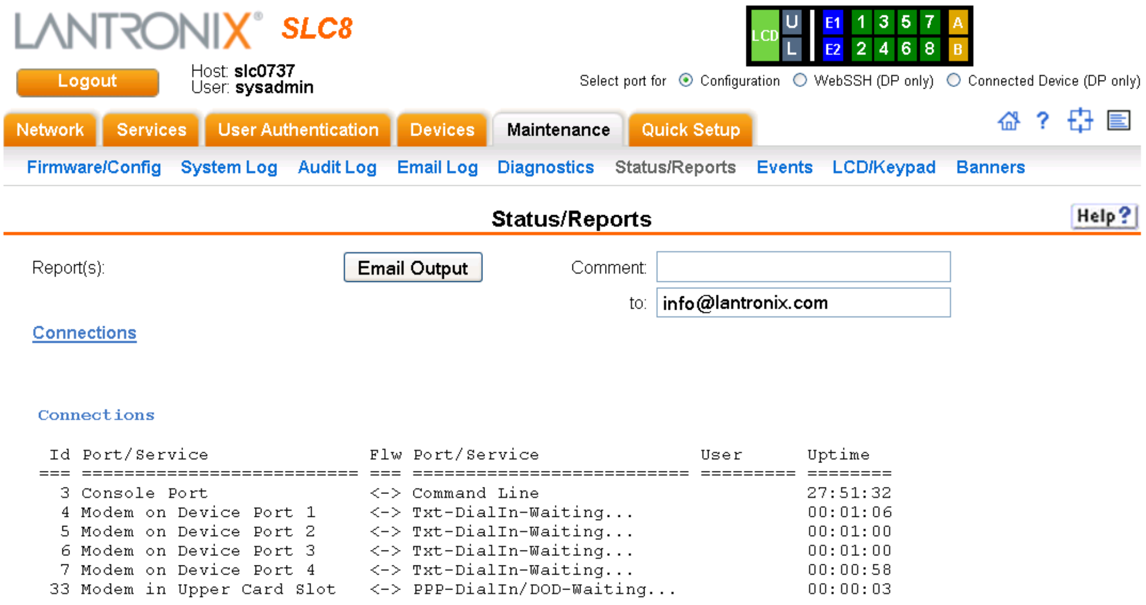
View Report

All	Displays all reports.
Port Status	Displays the status of each device port: mode, user, any related connections, and serial port settings.
Port Counters	Displays statistics related to the flow of data through each device port.

IP Routes	Displays the routing table.
Connections	Displays all active connections for the SLC unit: Telnet, SSH, TCP, UDP, device port, and modem.
System Configuration – Complete	Displays a complete snapshot of the SLC settings.
System Configuration – Basic	Displays a snapshot of the SLC unit's basic settings (for example, network, date/time, routing, services, console port).
System Configuration – Authentication	Displays a snapshot of authentication settings only (including a list of all localusers).
System Configuration - Devices	Displays a snapshot of settings for each device port.

3. Click the **Generate Report** button. In the upper left of the *Generated Status/Reports* page displays a list of reports generated.

Figure 13-10 Generated Status/Reports



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Status/Reports

Report(s): Connections

Comment:

to: info@lantronix.com

```
Connections

 Id Port/Service                Flw Port/Service                User      Uptime
=== ========================== === ========================== ========= ========
  3 Console Port                <-> Command Line                          27:51:32
  4 Modem on Device Port 1      <-> Txt-DialIn-Waiting...                 00:01:06
  5 Modem on Device Port 2      <-> Txt-DialIn-Waiting...                 00:01:00
  6 Modem on Device Port 3      <-> Txt-DialIn-Waiting...                 00:01:00
  7 Modem on Device Port 4      <-> Txt-DialIn-Waiting...                 00:00:58
 33 Modem in Upper Card Slot    <-> PPP-DialIn/DOD-Waiting...             00:00:03
```

4. To email these report(s), follow the instructions in *Emailing Logs and Reports (on page 236)*.

Status Commands

These commands for the command line interface correspond to the web page entries described above.

To display device port modes and states for one or more ports:

```
show portstatus [deviceport <Device Port List or Name>] [email <Email
Address>]
```

You can optionally email the displayed information.

To display a snapshot of configurable parameters:

```
show sysconfig [display <basic|auth|devices>] [email <Email Address]
```

You can optionally email the displayed information.

Displays a report of all configurable parameters or a shorter report with basic system settings, authentication settings, or device settings.

To generate a report for one or more ports:You can optionally email the displayed information.

```
show portcounters [deviceport <Device Port List or Name>] [email <Email
Address>]
```

To display the overall status of all SLC devices:

```
show sysstatus [email <Email Address>]
```

You can optionally email the displayed information.

To display a list of all current connections:

```
show connections [email <Email Address>]
```

You can optionally email the displayed information.

To provide details, e.g., endpoint parameters and trigger, for a specific connection:

```
show connections connid <Connection ID> [email <Email Address>]
```

You can optionally email the displayed information.

Note: *Use the basic* `show connections` *command to obtain the Connection ID.*

Emailing Logs and Reports

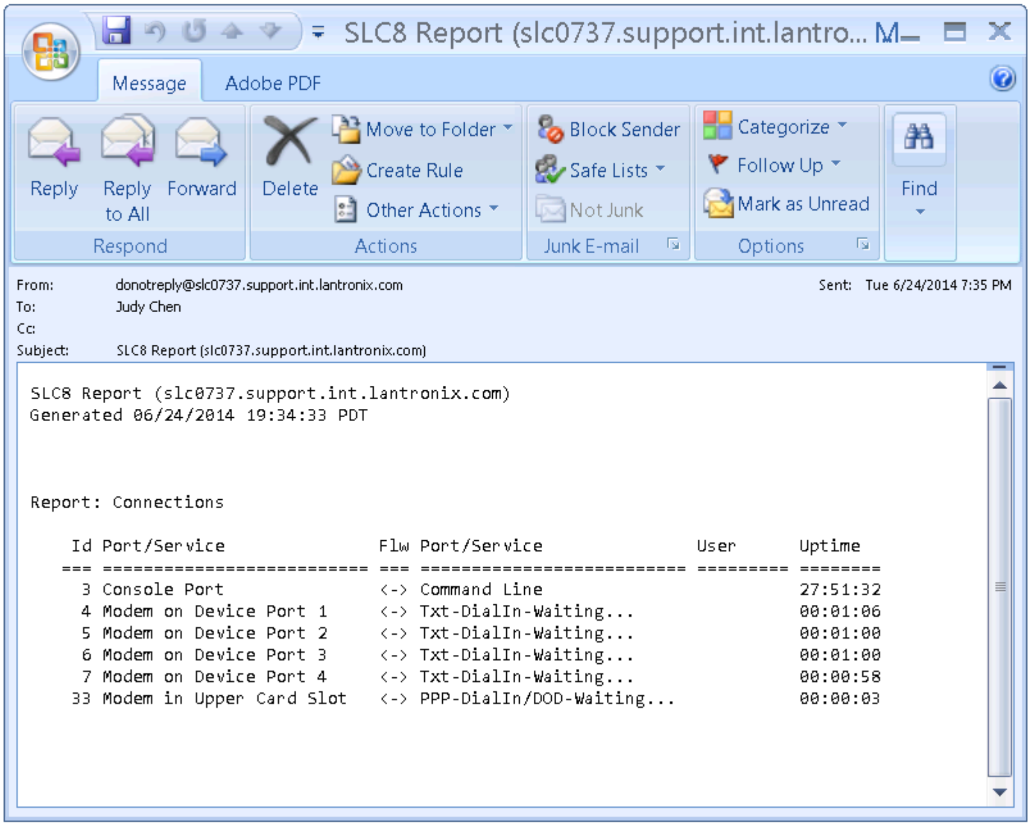
The following logs and reports can be directly emailed to a specific individual or to Lantronix Technical Support directly from the log page:

- System Log (i.e., *Figure 13-4*)
- Audit Log (i.e., *Figure 13-5*)
- Email Log (i.e., *Figure 13-6*)
- Diagnostic Reports (i.e., *Figure 13-8*)
- Status/Reports (i.e., *Figure 13-10*)

To email a log to an individual:

1. In the **Comment** field of a particular log or report page, enter a comment (if desired).
2. Select the **to** field beside the empty field where you then enter the person's email address.
3. Press the **Email Output** button. An email is immediately sent out and a confirmation appears on the screen.

Figure 13-11 Emailed Log or Report



From: donotreply@slc0737.support.int.lantronix.com

Sent: Tue 6/24/2014 7:35 PM

To: Judy Chen

Cc:

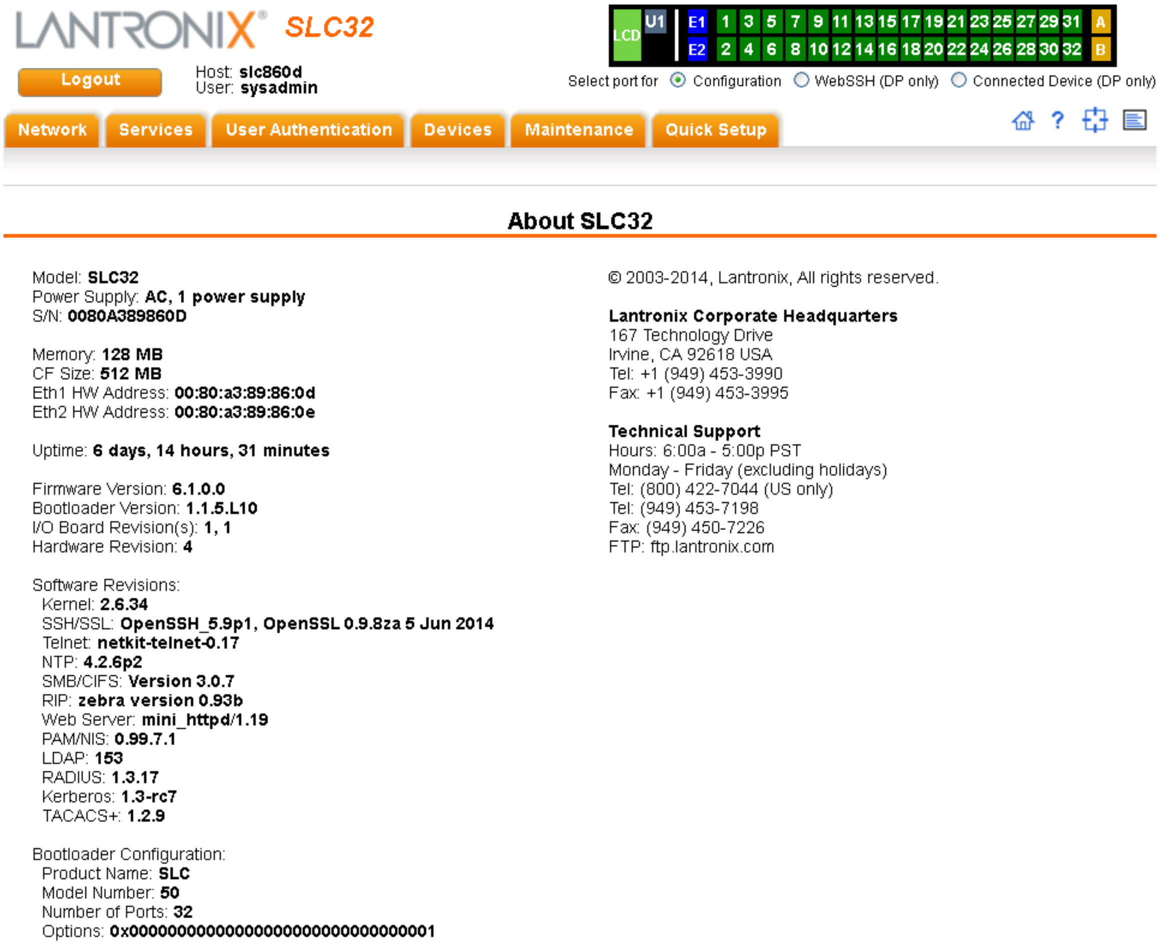
Subject: SLC8 Report (slc0737.support.int.lantronix.com)

```
SLC8 Report (slc0737.support.int.lantronix.com)
Generated 06/24/2014 19:34:33 PDT



Report: Connections

    Id Port/Service               Flw Port/Service               User      Uptime
   === ========================== === ========================== ========= ========
     3 Console Port               <-> Command Line                         27:51:32
     4 Modem on Device Port 1     <-> Txt-DialIn-Waiting...                00:01:06
     5 Modem on Device Port 2     <-> Txt-DialIn-Waiting...                00:01:00
     6 Modem on Device Port 3     <-> Txt-DialIn-Waiting...                00:01:00
     7 Modem on Device Port 4     <-> Txt-DialIn-Waiting...                00:00:58
    33 Modem in Upper Card Slot   <-> PPP-DialIn/DOD-Waiting...            00:00:03
```

To email a log to Lantronix Technical Support:

1. Click the **question mark ? icon on the upper right corner** to access SLC console manager device and setup information as well as contact information for Lantronix Technical Support (see *Figure 13-12*).

Figure 13-12 Lantronix Technical Support



Host: **slc860d**
User: **sysadmin**

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

About SLC32

Model: **SLC32**
Power Supply: **AC, 1 power supply**
S/N: **0080A389860D**

Memory: **128 MB**
CF Size: **512 MB**
Eth1 HW Address: **00:80:a3:89:86:0d**
Eth2 HW Address: **00:80:a3:89:86:0e**

Uptime: **6 days, 14 hours, 31 minutes**

Firmware Version: **6.1.0.0**
Bootloader Version: **1.1.5.L10**
I/O Board Revision(s): **1, 1**
Hardware Revision: **4**

Software Revisions:
Kernel: **2.6.34**
SSH/SSL: **OpenSSH_5.9p1, OpenSSL 0.9.8za 5 Jun 2014**
Telnet: **netkit-telnet-0.17**
NTP: **4.2.6p2**
SMB/CIFS: **Version 3.0.7**
RIP: **zebra version 0.93b**
Web Server: **mini_httpd/1.19**
PAM/NIS: **0.99.7.1**
LDAP: **153**
RADIUS: **1.3.17**
Kerberos: **1.3-rc7**
TACACS+: **1.2.9**

Bootloader Configuration:
Product Name: **SLC**
Model Number: **50**
Number of Ports: **32**
Options: **0x00000000000000000000000000000001**

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Hours: 6:00a - 5:00p PST
Monday - Friday (excluding holidays)
Tel: (800) 422-7044 (US only)
Tel: (949) 453-7198
Fax: (949) 450-7226
FTP: ftp.lantronix.com

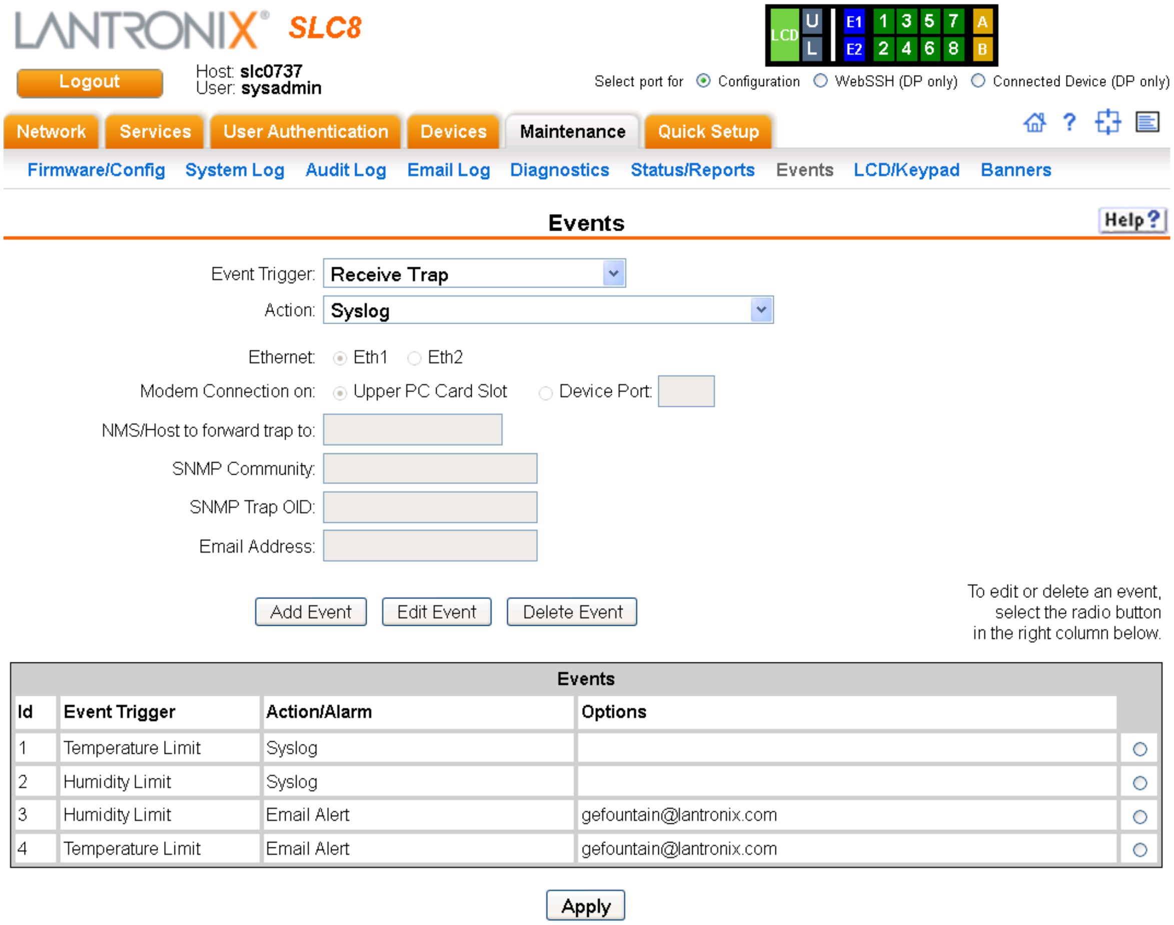
2. Call Lantronix Tech Support with the contact information provided and obtain a case number.
3. Press the **Email Output** button to send Lantronix Tech Support the log along with the identifying support number.
4. Click **OK** in the confirmation popup that appears.

Events

On this *Maintenance > Events* page, you can define what action you want to take for events that may occur in the SLC console manager.

1. Click the **Maintenance** tab and select the **Events** option. The following page displays:

Figure 13-13 Maintenance > Events



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

Events

Event Trigger: Receive Trap

Action: Syslog

Ethernet: ● Eth1 ○ Eth2

Modem Connection on: ● Upper PC Card Slot ○ Device Port:

NMS/Host to forward trap to:

SNMP Community:

SNMP Trap OID:

Email Address:

To edit or delete an event, select the radio button in the right column below.

Events

Id	Event Trigger	Action/Alarm	Options	
1	Temperature Limit	Syslog		○
2	Humidity Limit	Syslog		○
3	Humidity Limit	Email Alert	gefountain@lantronix.com	○
4	Temperature Limit	Email Alert	gefountain@lantronix.com	○

2. Enter the following:

Event Trigger	From the drop-down list, select the type of incident that triggers an event. Currently, the options are: ◆ Receive Trap ◆ Temperature Over/Under Limit (for Sensorsoft devices) ◆ Humidity Over/Under Limit (for Sensorsoft devices) ◆ Device Port Data Drop ◆ Curent Over Threshold ***Note:*** *Certain event triggers are available on some SLC and SLB models.*
Action	From the drop-down list, select the action taken because of the trigger. For example, the action can be writing an entry into the syslog with details of the event or sending the trap(s) to the Ethernet or modem connection.
Ethernet	For actions that require an Ethernet connection (for example, **Forward All Traps to Ethernet**), select the Ethernet port to use.

Modem Connection on	For actions that require a modem connection (for example, **Forward All Traps to a Modem Connection**, select which device port or USB port/PC Card with a modem connection to use.
NMS/Host to forward trap to	For actions that forward a trap, enter the IP address of the computer to forward the trap to. The computer does not have to be an SNMP NMS; it just has to be capable of receiving SNMP traps.
SNMP Community	Forwarded traps are sent with this SNMP community value There is no default.
SNMP Trap OID	Enter a unique identifier for an SNMP object. (An SNMP object is anything that can hold a value and can be read using an SNMP "get" action.) The OID consists of a string of numbers separated by periods (for example, 1.1.3.2.1). Each number is part of a group represented by the number on its left.
Email Addresses	Enter an email address to receive email alerts.

3. You have the following options:

   - To add the defined event, click the **Add Event** button. The event displays in the Events table at the bottom of the page.
   - To edit an event, select the event from the Events table and click the **Edit Event** button. The *Maintenance > Events* page displays the event.
   - To delete an event, select the event from the Events table and click the **Delete Event** button. A message asks for confirmation. Click **OK**.

4) To save, click **Apply**.

Events Commands

To manage the response to events that occur in the SLC unit:

```
admin events add <trigger> <response>
   <trigger> is one of:
      |receivetrap|templimit|humidlimit|overcurrent|dpdatadrop
      |inletstatus|nomodemdial
   <response> is one of:
      action <syslog>
      action <fwdalltrapseth|fwdseltrapeth> ethport <1|2> nms <SNMP NMS>
      community <SNMP Community> [oid <SNMP OID>]
      action <fwdalltrapsmodem|fwdseltrapmodem> deviceport <Device Port
      # or Name> nms <SNMP NMS> community <SNMP Community> [oid <SNMP
      Trap OID>]
      action <fwdalltrapsmodem|fwdseltrapmodem> usbport <U1>
      pccardslot <upper|lower>
      nms <SNMP NMS> community <SNMP Community> [oid <SNMP Trap OID>]
      action <emailalert> emailaddress <destination email address>
```

To update event definitions:

```
admin events edit <Event ID> <parameters>
```

Parameters:

```
community <SNMP Community>
deviceport <Device Port # or Name>
ethport <1|2>
```

```
nms <SNMP NMS>
oid <SNMP Trap OID>
usbport <U1|U2>
```

To delete an event:

```
admin events delete <Event ID>
```

To view events:

```
admin events show
```

LCD/Keypad

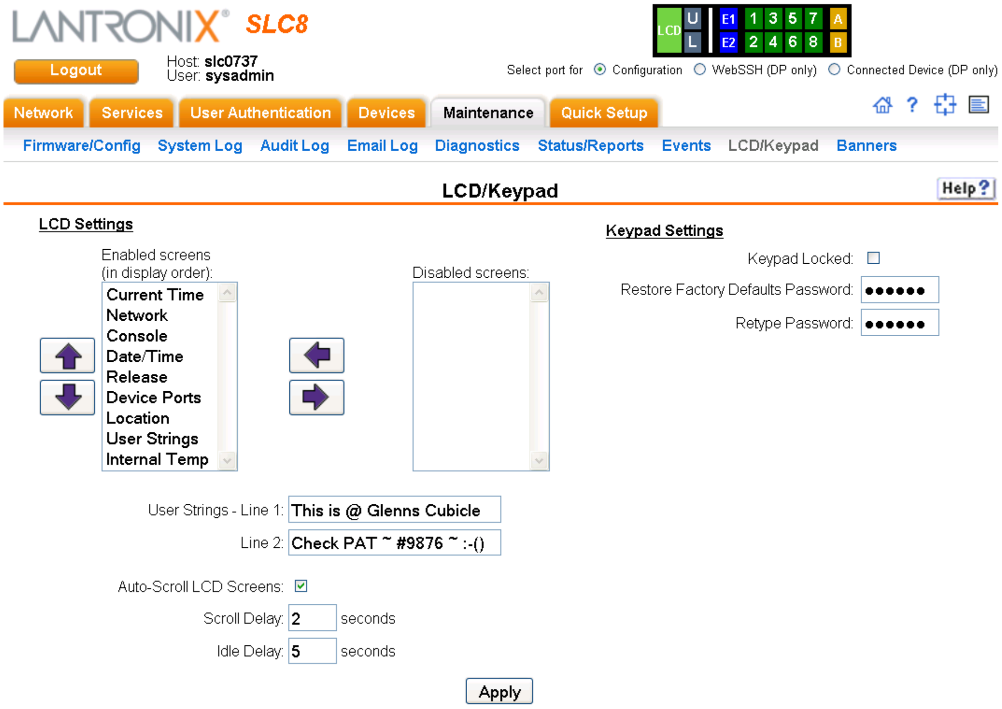
The LCD has a series of screens, consisting of 2 lines of 24 characters each. Specific screens and the display order can be configured. The keypad associated with the LCD can also be configured. The types of screens include: current time, network settings, console settings, date and time, release version, location, and custom user strings.

Enabling the **Auto-Scroll LCD Screens** option enables scrolling through the screens and pausing the number of seconds specified by the **Scroll Delay** between each screen. After any input to the keypad, the LCD waits until the keypad has been idle for the number of seconds specified by the **Idle Delay** before scrolling of the screens continues.

To configure the LCD and Keypad:

1. Click the **Maintenance** tab and select the **LCD/Keypad** option.

Figure 13-14 Maintenance > LCD/Keypad



Host: slc0737
User: sysadmin

Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)

LCD/Keypad

LCD Settings

Enabled screens (in display order):
Current Time
Network
Console
Date/Time
Release
Device Ports
Location
User Strings
Internal Temp

Disabled screens:

User Strings - Line 1: This is @ Glenns Cubicle
Line 2: Check PAT ~ #9876 ~ :-()

Auto-Scroll LCD Screens: ☑
Scroll Delay: 2 seconds
Idle Delay: 5 seconds

Keypad Settings

Keypad Locked: □
Restore Factory Defaults Password: ●●●●●●
Retype Password: ●●●●●●

To configure the LCD:

The screens that are currently enabled are displayed in order in the left Enabled screens list.

1. Select a screen to be removed from the **Enabled Screens** and click the ➡ button. The screen moves to the **Disabled Screens** list to the right.
2. Select a screen to be added from the **Disabled Screens** list and click the ⬅ button. The screen is added to the **Enabled Screens** to the left.
3. Select a screen in the **Enabled Screens** list and click the ⬆ or ⬇ button to change the order of the screens.

Note: *The User Strings screen displays the 2 lines defined by the User Strings - Line 1 and Line 2 fields. By default, these user strings are blank.*

4. Click **Apply** to save.

To configure the Keypad:

1. Enter the following fields.

Keypad Locked	Select this to lock out any input to the keypad. The default is for the keypad to be unlocked.
Restore Factory Defaults Password / Retype Password	Enter the 6 digit key sequence entered at the keypad to restore the SLC unit to factory defaults. The default is **999999**.

2. Click **Apply** to save.

LCD/Keypad Commands

The following CLI commands correspond to the *Maintenance > LCD/Keypad* page. For more information, see *Chapter 15: Command Reference*.

- `admin keypad lock`
- `admin keypad password`
- `admin keypad show`
- `admin lcd reset`
- `admin lcd default`
- `admin lcd screens`
- `admin lcd line1`
- `admin lcd scrolling`
- `admin lcd show`

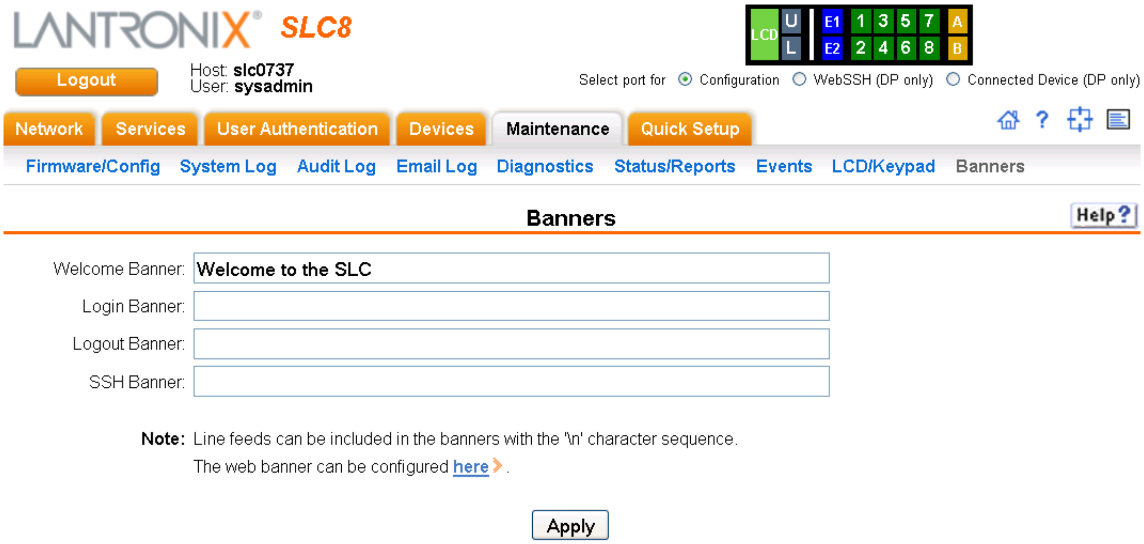
Banners

The *Maintenance > Banners* page allows the system administrator to customize text messages that display to users.

To configure banner settings:

1. Click the **Maintenance** tab and select **Banners** option.

Figure 13-15 Maintenance > Banners



LANTRONIX SLC8
Logout
Host: slc0737
User: sysadmin
LCD U L E1 E2 1 3 5 7 2 4 6 8 A B
Select port for ● Configuration ○ WebSSH (DP only) ○ Connected Device (DP only)
Network Services User Authentication Devices Maintenance Quick Setup
Firmware/Config System Log Audit Log Email Log Diagnostics Status/Reports Events LCD/Keypad Banners
Banners
Help?
Apply

Welcome Banner: Welcome to the SLC

Login Banner:

Logout Banner:

SSH Banner:

Note: Line feeds can be included in the banners with the '\n' character sequence.
The web banner can be configured here.

2. Enter the following fields.

Welcome Banner	The text to display on the command line interface before the user logs in. May contain up to 1024 characters (single quote and double quote characters are not supported). **Welcome to the SLC** unit is the default. ***Note:*** *To create more lines use the* ***\n*** *character sequence.*
Login Banner	The text to display on the command line interface after the user logs in. May contain up to 1024 characters (single quote and double quote characters are not supported). Default is blank. ***Note:*** *To create more lines, use the* ***\n*** *character sequence.*
Logout Banner	The text to display on the command line interface after the user logs out. May contain up to 1024 characters (single quote and double quote characters are not supported). Default is blank. ***Note:*** *To create more lines use, the* ***\n*** *character sequence.*
SSH Banner	The text to display when a user logs into the SLC device via SSH, prior to authentication. May contain up to 1024 characters (single quote and double quote characters are not supported). Blank by default. ***Note:*** *To create more lines use the* ***\n*** *character sequence.*

3. Click **Apply** to save.

Banner Commands

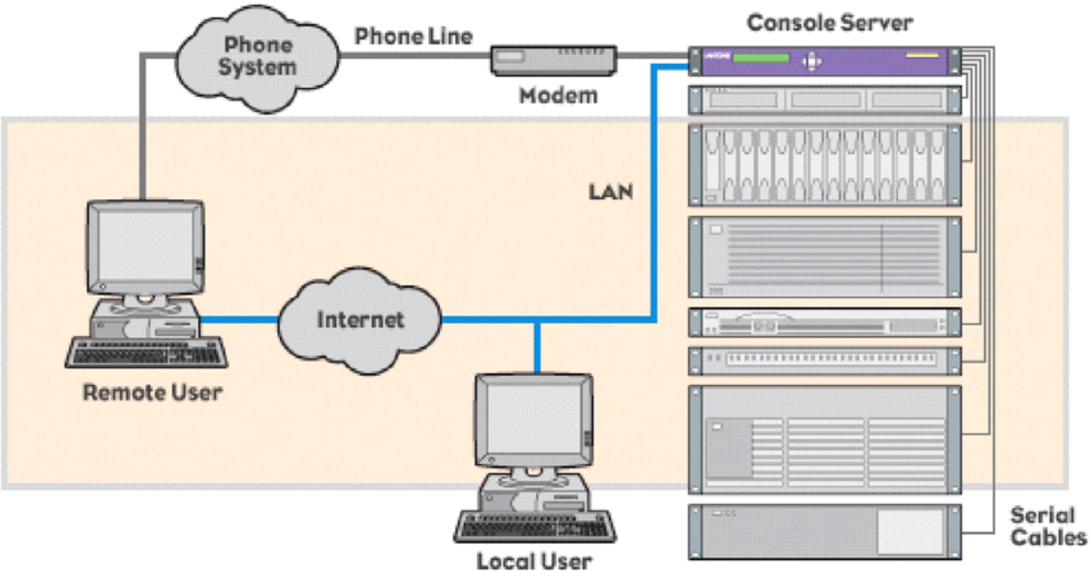
The following CLI commands correspond to the *Maintenance > Banners* page. For more information, see *Chapter 15: Command Reference*.

- `admin banner login`
- `admin banner logout`
- `admin banner show`
- `admin banner ssh`
- `admin banner welcome`

14: Application Examples

Each SLC console manager has multiple serial ports and two network ports as shown in *Figure 14-1*. Each serial port can be connected to the console port of a device. Using a network in-band port or an out-of-band modem for a dial-up connection, an administrator can remotely access any of the connected devices using Telnet or SSH.

Figure 14-1 SLC Console Manager



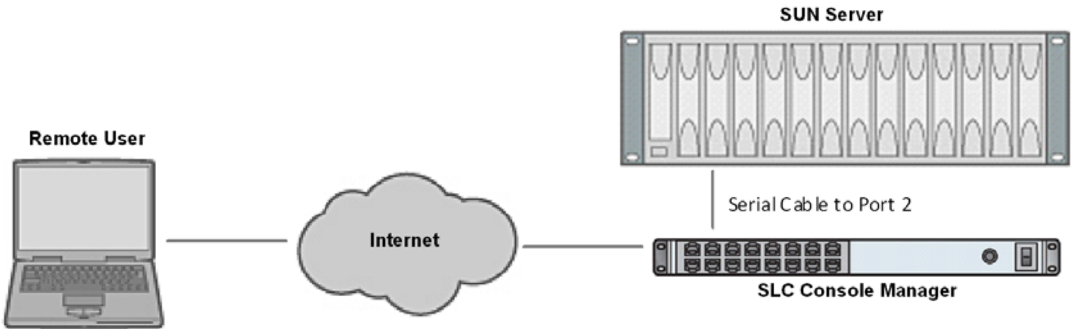
This chapter includes three examples that use the SLC device. The examples assume that the SLC console manager is connected to the network and has already been assigned an IP address.

In the examples, the command line interface is shown. You can perform the same configurations using the web page interface except for directly interacting with the SLC device (`direct` command).

Telnet/SSH to a Remote Device

Figure 14-2 shows a SUN server connected to port 2 of the SLC console manager .

Figure 14-2 Remote User Connected to a SUN Server via the SLC Device



In the example below, the system administrator performs the following steps:

1. Display the settings for device port 2 by using the `show deviceport` command.

```
[SLC]> show deviceport port 2
___Current Device Port Settings________________________________________________
Number: 2  Name: Port-2

Modem Settings------------------Data Settings----------IP Settings---------
Modem State: disabled            Baud Rate: 9600        Telnet: disabled
Modem Mode: text                 Data Bits: 8           Telnet Port: 2002
Timeout Logins: disabled         Stop Bits: 1           SSH: disabled
Local IP: negotiate              Parity: none           SSH Port: 3002
Remote IP: negotiate             Flow Control: xon/xoff IP: <none>
Authentication: PAP              Logins: disabled
CHAP Host: <none>                Break Sequence: \x1bB
CHAP Secret: <none>              Check DSR: disabled
NAT: disabled                    Close DSR: disabled
Dial-out Login: <none>
Dial-out Password: <none>
Dial-out Number: <none>
Dial-back Number: usernumber
Initialization Script: <none>

Logging Settings---------------------------------------------------------------
Local Logging: disabled          PC Card Logging: disabled
Email Logging: disabled          Log to: upper slot
Byte Threshold: 100              Max number of files: 10
Email Delay: 60   seconds        Max size of files: 2048
Restart Delay: 60   seconds
Email To: <none>
Email Subject: Port%d Logging
Email String: <none>
NFS File Logging: disabled
Directory to log to: <none>
Max number of files: 10
Max size of files: 2048
```

2. Change the baud to 57600 and disable flow control by using the `baud` and `flowcontrol` parameters.

```
[SLC]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Connect to the device port y using the `connect direct` command.

```
[SLC]> connect direct deviceport 2
```

4. View messages from the SUN server console.

```
Mar 15 09:09:44 tssf280r sendmail[292]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): SMTP+queueing@00:15:00
Mar 15 09:09:44 tssf280r sendmail[293]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): queueing@00:15:00
Mar 15 14:44:40 tssf280r sendmail[275]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): SMTP+queueing@00:15:00
Mar 15 14:44:40 tssf280r sendmail[276]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): queueing@00:15:00
```

5. Reboot the SUN server by using the `reboot` command.

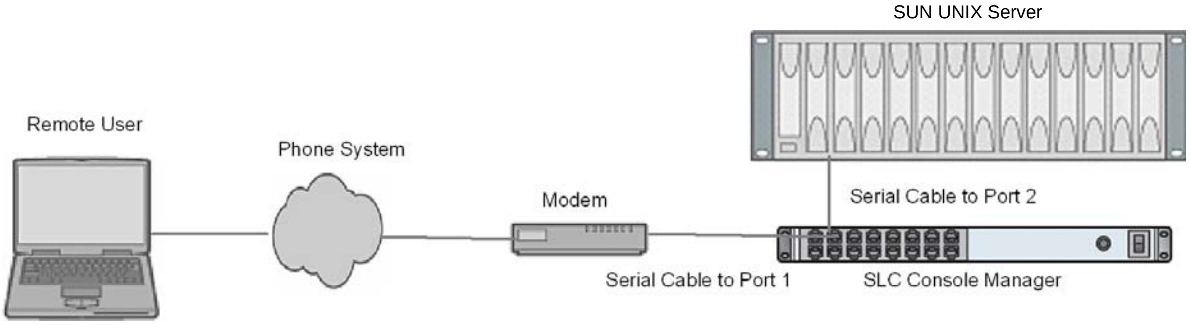
```
reboot
<shutdown messages from SUN>
```

6. Use the escape sequence to escape from direct mode back to the command line interface.

Dial-in (Text Mode) to a Remote Device

The example in *Figure 14-3* shows a modem connected to the SLC console manager device port 1, and a SUN server connected to the SLC device port 2. You can configure the modem for text mode dial-in, so a remote user can dial into the modem using a terminal emulation program and access the SUN server. HyperTerminal™ which comes with the Microsoft ® Windows™ operating system, is an example of a terminal emulation program.

Figure 14-3 Connection to SUN UNIX Server



In this example, the system administrator performs the following steps.

1. Configure the device port that the modem is connected to for dial-in by using the set deviceport command with the shown parameters.

```
[SLC]> set deviceport port 1 modemmode text
Device Port settings successfully updated.

[SLC]> set deviceport port 1 initscript "AT&F&K3&C1&D2%C0A"
Device Port settings successfully updated.

[SLC]> set deviceport port 1 auth pap
Device Port settings successfully updated.

[SLC]> set deviceport port 1 localsecret "password"
Device Port settings successfully updated.

[SLC]> set deviceport port 1 modemstate dialin
Device Port settings successfully updated.

[SLC]>
```

2. Configure the device port that is connected to the console port of the SUN UNIX server by using the `baud` and `flowcontrol` parameters.

```
[SLC]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Dial into the SLC console manager via the modem using a terminal emulation program on a remote PC. A command line prompt displays.

4. Log into the SLC console manager.

```
CONNECT 57600

Welcome to the SLC

login: sysadmin
Password:

Welcome to the SLC Console Manager
Model Number: SLC 48
For a list of commands, type 'help'.

[SLC]>
```

5. Connect to the SUN UNIX server using the `connect direct` command.

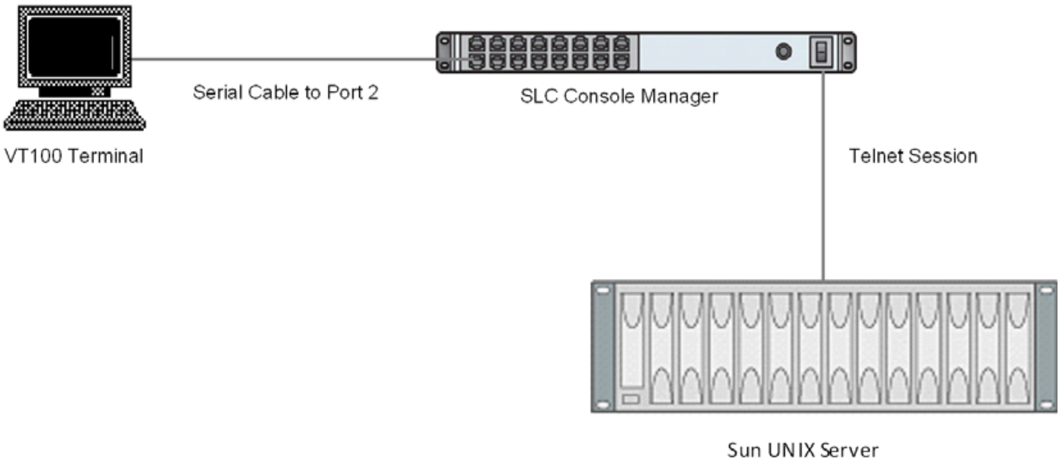
```
[SLC]> connect direct deviceport 2
SunOS 5.7

login: frank
Password:
Last login: Wed Jul 14 16:07:49 from computer
Sun Microsystems Inc.   SunOS 5.7       Generic October 1998
SunOS computer 5.7 Generic_123485-05 sun4m sparc SUNW,SPARCstation-20
$
```

6. Use the escape sequence to escape from direct mode back to the command line interface.

Local Serial Connection to Network Device via Telnet

Figure 14-4 shows a terminal device connected to the SLC console manager device port 2, and a SUN server connected over the internet to the SLC device. When a connection is established between the device port and an outbound Telnet session, users can access the SUN server as though directly connected to it. (See *Chapter 11: Connections* for more information).

Figure 14-4 Terminal Device Connection to the SLC Console Manager



The system administrator performs the following steps.

1. Display the settings for device port 2 by using the `show deviceport` command.

```
[SLC]> show deviceport port 2
___Current Device Port Settings________________________________________________
Number: 2  Name: Port-2

Modem Settings-------------------Data Settings----------IP Settings---------
Modem State: disabled            Baud Rate: 9600        Telnet: disabled
Modem Mode: text                 Data Bits: 8           Telnet Port: 2002
Timeout Logins: disabled         Stop Bits: 1           SSH: disabled
Local IP: negotiate              Parity: none           SSH Port: 3002
Remote IP: negotiate             Flow Control: xon/xoff IP: <none>
Authentication: PAP              Logins: disabled
CHAP Host: <none>                Break Sequence: \x1bB
CHAP Secret: <none>              Check DSR: disabled
NAT: disabled                    Close DSR: disabled
Dial-out Login: <none>
Dial-out Password: <none>
Dial-out Number: <none>
Dial-back Number: usernumber
Initialization Script: <none>

Logging Settings---------------------------------------------------------------
Local Logging: disabled          PC Card Logging: disabled
Email Logging: disabled          Log to: upper slot
Byte Threshold: 100              Max number of files: 10
Email Delay: 60   seconds        Max size of files: 2048
Restart Delay: 60   seconds
Email To: <none>
Email Subject: Port%d Logging
Email String: <none>
NFS File Logging: disabled
Directory to log to: <none>
Max number of files: 10
Max size of files: 2048
```

2. Change the serial settings to match the serial settings for the vt100 terminal by using the `baud` and `flowcontrol` parameters.

```
[SLC]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Create a connection between the vt100 terminal connected to device port 2 and an outbound telnet session to the server by using the `connect bidirection` command.

```
[SLC]> connect bidirection 2 telnet 192.168.1.1
Connection settings successfully updated.
```

4. At the VT100 terminal, press <return> a couple of times. The Telnet prompt from the server displays the following message.

```
Trying 192.168.1.1...
Connected to 192.168.1.1.
Escape character is '^]'.

Sun OS 8.0

login:
```

You can log in and interact with the SUN server at the VT100 terminal as if directly connected to the server.

15: Command Reference

This chapter lists and describes all of the commands available on the SLC command line interface (CLI) accessed by using Telnet, SSH, or a serial connection. In addition to the commands, this chapter contains the following sections:

- *Introduction to Commands*
- *Deprecated Commands*

The following is an alphabetical listing of categories and within each category there is a list of commands in alphabetical order:

- *Administrative Commands*
- *Audit Log Commands*
- *Authentication Commands*
- *CLI Commands*
- *Connection Commands*
- *Console Port Commands*
- *Custom User Menu Commands*
- *Date and Time Commands*
- *Deprecated Commands*
- *Device Commands*
- *Device Port Commands*
- *Diagnostic Commands*
- *Email Log Commands*
- *Events Commands*
- *Group Commands*
- *Host List Commands*
- *IP Filter Commands*
- *Kerberos Commands*
- *LDAP Commands*
- *Local Users Commands*
- *Log Commands*
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Introduction to Commands

This section explains command syntax, command line help, and tips for using commands. For more detailed information about commands, see *Command Line Interface on page 42*.

Command Syntax

Commands have the following syntax: <action> <category> <parameters>. The <action> value can be one of the following: set, show, connect, diag, pccard, admin, or logout. The <category> value is a group of related parameters that you can configure or view. Examples are ntp, deviceport, and network.

The <parameters> value is one or more name-value pairs in one of the following formats:

- <aa | bb> User must specify one of the values (aa or bb) separated by a vertical line (|). The values are in all lowercase and must be entered exactly as shown. Bold indicates a default value.
- <value> User must specify an appropriate value, for example, an IP address. The parameter values are in mixed case. Square brackets [ ] indicate optional parameters.

Command Line Actions and Categories

Table 15-1 lists the actions and categories for each action.

Table 15-1 Actions and Category Options

Action	Category
set	auth | cifs | cli | command | consoleport | datetime | deviceport | groups | history | hostlist | ipfilter | kerberos | ldap | localusers | log | menu | network | nfs | nis | ntp | password | radius | remoteusers | routing | script | services | slcnetwork | sshkey | tacacs+ | temperature | usb[1]
show	auth | auditlog | cifs | cli | connections | consoleport | datetime | deviceport | emaillog | groups | history | hostlist | ipfilter | kerberos | ldap | localusers | log | menu | network | nfs | nis | ntp | pccard[2] | portcounters | portstatus | radius | remoteusers | routing | script | services | slcnetwork | sshkey | sysconfig | syslog | sysstatus | tacacs+ | temperature | usb[1] | user | vpn
connect	bidirection | direct | global | listen | script | terminate | unidirection
diag	arp | internals | lookup | loopback | netstat | nettrace | perfstat | ping | ping6| sendpacket | traceroute
pccard[2]	modem | storage
admin	banner | clear | config | events | firmware | ftp | keypad | lcd | memory | quicksetup | reboot| shutdown | site | version | web
logout	terminates CLI session

[1] USB commands are only accessible on SLC USB part number -03.

[2] PC Card commands are only accessible on SLC USB part number -02.

For general help and to display the commands to which you have rights, type `help`. For general command line help, type `help <command line>`. For more information about a specific command, type `help` followed by the command. For example, `help set network` or `help admin firmware`.

Tips

- Type enough characters to identify the action, category, or parameter name uniquely. For parameter values, type the entire value. For example, you can shorten:

  ```
  set network port 1 state static ipaddr 122.3.10.1 mask 255.255.0.0
  ```

  to

  ```
  se net po 1 st static ip 122.3.10.1 ma 255.255.0.0.
  ```

- Use the **Tab** key to automatically complete action, category, or parameter names. Type a partial name and press **Tab** either to complete the name if only one is possible, or to display the possible names if more than one is possible. Following a space after the preceding name, **Tab** displays all possible names.

- Should you make a mistake while typing, backspace by pressing the **Backspace** key and/or the **Delete** key, depending on how you accessed the interface. Both keys work if you use VT100 emulation in your terminal access program when connecting to the console port. Use the **left** and **right** arrow keys to move within a command.
- Use the **up** and **down arrows** to scroll through previously entered commands. If desired, select one and edit it. You can scroll through up to 100 previous commands entered in the session.
- To clear an IP address, type `0.0.0.0`, or to clear a non-IP address value, type `CLEAR` for parameters which accept the `CLEAR` command. CLI parameters which accept `CLEAR` are listed at the beginning of each section.
- When the number of lines displayed by a command exceeds the size of the window (the default is 25), the command output is halted until you are ready to continue. To display the next line, press Enter, and to display the page, press the space bar. You can override the number of lines (or disable the feature altogether) with `set cli`.

Deprecated Commands

Deprecated commands in this release are as follows:

- set locallog (replaced by *set log clear (on page 287)*)
- show locallog (replaced by *show log local (on page 288)*)

Administrative Commands

```
admin banner login
```

Syntax

```
admin banner login <Banner Text>
```

Description

Configures the banner displayed after the user logs in.

Note: *To go to the next line, type \n and press Enter.*

```
admin banner logout
```

Syntax

```
admin banner logout <Banner Text>
```

Description

Configures the banner displayed after the user logs out.

Note: *To go to the next line, type \n and press Enter.*

```
admin banner show
```

Syntax

```
admin banner show
```

Description

Displays the welcome, login and logout banners.

```
admin banner ssh
```

Syntax

```
admin banner ssh <Banner Text>
```

Description

Configures the banner that displays prior to SSH authorization.

```
admin banner welcome
```

Syntax

```
admin banner welcome <Banner Text>
```

Description

Configures the banner displayed before the user logs in.

Note: *To go to the next line, type \n and press Enter.*

```
admin clear
```

Syntax

```
admin clear tmpdir
```

Description

Resets system resources and clears the temporary directory.

```
admin config copy
```

Syntax

```
admin config copy <current|Config Name> [location <local | nfs | cifs |
pccard> | usb] [nfsdir <NFS Mounted Directory>] [usbport
<U1>][pccardslot <upper|lower>]
```

Description

Copies the current configuration (or optionally, a configuration from another location) to the other bank (for dual-boot SLC console managers).

```
admin config rename|delete
```

Syntax

```
admin config rename|delete <Config Name> location <local | nfs | cifs |
usb | pccard> [nfsdir <NFS Mounted Directory>] [usbport <U1>]
[pccardslot <upper|lower>]
```

Description

Deletes or renames a configuration (the user is prompted for the new name when renaming.

```
admin config factorydefaults
```

Syntax

```
admin config factorydefaults [savesshkeys <enable|disable>][savesslcert
<enable|disable>] [savescripts <enable|disable>] [preserveconfig <Config
Params to Preserve>]
```

<Config Params to Preserve>

```
      nt - Networking    ra - Remote Authentication
      sv - Services      dp - Device Ports
      dt - Date/Time     pc - PC Card
      lu - Local Users   ub - USB / pc - PC Card
```

Note: *The Config Params to Preserve get contained as a comma-separated list of current configuration parameters that are kept after the config restore or factorydefaults.*

Description

Restores the factory default settings.

```
admin config restore
```

Syntax

```
admin config restore <Config Name> location <local | ftp | sftp | nfs |
cifs | pccard | usb> [nfsdir <NFS Mounted Directory>] [usbport
<U1>][pccardslot <upper|lower>] [savesshkeys <enable|disable>]
[savesslcert <enable|disable>] [savescripts <enable|disable>]
[preserveconfig <Config Params to Preserve>]
```

<Config Params to Preserve>

```
      nt - Networking    ra - Remote Authentication
      sv - Services      dp - Device Ports
      dt - Date/Time     pc - PC Card
      lu - Local Users   ub - USB
```

Note: *The Config Params to Preserve get contained as a comma-separated list of current configuration parameters that are kept after the config restore or factorydefaults.*

Description

Restores a saved configuration to the SLC console manager.

```
admin config save
```

Syntax

```
admin config save <Config Name> location <local | ftp | sftp | nfs | cifs
| pccard | usb> [nfsdir <NFS Mounted Directory>] [usbport <U1>]
[pccardslot <upper|lower>] [savesshkeys <enable|disable>] [savesslcert
<enable|disable>] [savescripts <enable|disable>]
```

Description

Saves the current SLC configuration to a selected location.

```
admin config show
```

Syntax

```
admin config show <default|ftp|sftp|nfs|cifs|pccard|usb> [nfsdir <NFS
Mounted Dir>] [usbport <U1>][pccardslot <upper|lower>]
```

Description

Lists the configurations saved to a location.

```
admin firmware bootbank
```

Syntax

```
admin firmware bootbank <1|2>
```

Description

Sets the boot bank to be used at the next SLC console manager reboot. Applies to dual-boot SLC devices only.

```
admin firmware copybank
```

Syntax

```
admin firmware copybank
```

Description

Copies the boot bank from the currently booted bank to the alternate bank (for dual-boot SLC console managers).

```
admin firmware show
```

Syntax

```
admin firmware show [viewlog <enable|disable>]
```

Description

Lists the current firmware revision, the boot bank status (for dual-boot SLC console managers), and optionally displays the log containing details about firmware updates.

```
admin firmware update
```

Syntax

```
admin firmware update <ftp | tftp | sftp | nfs | pccard |usb> file
<Firmware File> key <Checksum Key> [nfsdir <NFS Mounted
Directory>][usbport <U1>] [pccardslot <upper|lower>]
```

Description

Updates SLC firmware to a new revision. You should be able to access the firmware file using the settings admin ftp show displays. The SLC console manager automatically reboots after successful update.

The following list includes options which accept the `CLEAR` command:

Note: *`CLEAR` must be in all caps.*

`admin ftp`	`login, path`

```
admin ftp password
```

Syntax

```
admin ftp password
```

Description

Sets the FTP server password and prevent it from being echoed.

```
admin ftp server
```

Syntax

```
admin ftp server <IP Address or Name> [login <User Login>] [path
<Directory>]
```

Description

Sets the FTP/TFTP/SFTP server used for firmware updates and configuration save/restore.

```
admin ftp show
```

Syntax

```
admin ftp show
```

Description

Displays FTP settings.

```
admin keypad
```

Syntax

```
admin keypad <lock|unlock>
```

Description

Locks or unlocks the LCD keypad. If the keypad is locked, you can scroll through settings but not change them.

```
admin keypad password
```

Syntax

```
admin keypad password (Must be 6 digits.)
```

Description

Changes the Restore Factory Defaults password used at the LCD to return the SLC console manager to the factory settings.

```
admin keypad show
```

Syntax

```
admin keypad show
```

Description

```
Displays keypad settings.
```

```
admin lcd default
```

Syntax

```
admin lcd default
```

Description

Restores the LCD screens to their factory default settings.

```
admin lcd reset
```

Syntax

```
admin lcd reset
```

Description

Restarts the program that controls the LCD.

```
admin lcd line1
```

Syntax

```
admin lcd line1 <1-24 Chars> line2 <1-24 Chars>
```

Description

Sets the strings displayed on the LCD user string screen.

```
admin lcd screens
```

Syntax

```
admin lcd screens <zero or more parameters>
```

Parameters

```
      currtime <1-8>
      network <1-8>
      console <1-8>
      datetime <1-8>
      release <1-8>
      devports <1-8>
      location <1-8>
      userstrings <1-8>
```

Description

Sets which screens that display on the LCD, and the display order. Any screens omitted from the `admin lcd screens` command are disabled. Omitting all screens results in a blank LCD.

```
admin lcd scrolling
```

Syntax

```
admin lcd scrolling <enable|disable> [scrolldelay <Delay in Seconds>]
[idledelay <Delay in Seconds>]
```

Description

Configures auto-scroll of the LCD screens, including the number of seconds after keypad input before auto-scrolling restarts.

```
admin lcd show
```

Syntax

```
admin lcd show
```

Description

Displays the LCD screens.

```
admin memory
```

Syntax

```
admin memory
```

Description

Displays information about SLC memory usage and allows configuration of a swap space if available memory is low. Creates a swap space on the SLC disk or an external storage device:

```
admin memory swap add <Size of Swap in MB> [usbport <U1>]
```

Deletes the swap space from the SLC disk or an external storage device:

```
admin memory swap delete
admin memory show
```

```
admin quicksetup
```

Syntax

```
admin quicksetup
```

Description

Runs the quick setup script.

```
admin reboot
```

Syntax

```
admin reboot
```

Description

Terminates all connections and reboots the SLC console manager. The front panel LCD displays the “Rebooting the SLC” message, and the normal boot sequence occurs.

```
admin site
```

Syntax

```
admin site row <Data Center Rack Row Number>
admin site cluster <Data Center Rack Group Number>
admin site rack <Data Center Rack Number>
```

Description

Configures information about the SLC location.

```
admin site show
```

Syntax

```
admin site show
```

Description

Displays the row, cluster, and rack on which the SLC console manager is installed.

```
admin shutdown
```

Syntax

```
admin shutdown
```

Description

Prepares the SLC console manager to be powered off.

When you use this command to shut down the SLC console manager, the LCD front panel displays the “Shutting down the SLC” message, followed by a pause, and then “Shutdown complete.” When “Shutdown complete” displays, it is safe to power off the SLC console manager. This command is not available on the Web page.

```
admin version
```

Syntax

```
admin version
```

Description

Displays current hardware and firmware information.

```
admin web certificate
```

Syntax

```
admin web certificate import via <sftp|scp> certfile <Certificate File>
privfile <Private Key File> host <IP Address or Name> login <User Login>
[path <Path to Files>]
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

admin web	group, banner

Description

Imports an SSL certificate.

```
admin web certificate reset
```

Syntax

```
admin web certificate reset
```

Description

Resets a web certificate.

```
admin web certificate show
```

Syntax

```
admin web certificate show
```

Description

Displays a web certificate.

```
admin web cipher
```

Syntax

```
admin web cipher <himed|himedlow>
```

Description

Configures the strength of the cipher used by the web server (high is 256 or 128 bit, medium is 128 bit, low is 64, 56 or 40 bit).

```
admin web gadget
```

Syntax

```
admin web gadget <enable|disable>
```

Description

Enables or disables iGoogle Gadget web content.

```
admin web iface
```

Syntax

```
admin web iface <none,eth1,eth2,ppp>
```

Description

Defines a list of network interfaces the web is available on:

```
admin web group
```

Syntax

```
admin web group <Local or Remote Group Name>
```

Description

Configures the group that can access the web:

```
admin web banner
```

Syntax

```
admin web banner <Banner Text>
```

Description

Configures the banner displayed on the web home page:

```
admin web protocol
```

Syntax

```
admin web protocol <sslv2|nosslv2>
```

Description

Configures the web server to use SSLv2 in addition to SSLv3 and TLSv1.

```
admin web timeout
```

Syntax

```
admin web timeout <disable|5-120>
```

Description

Configures the timeout for web sessions.

```
admin web terminate
```

Syntax

```
admin web terminate <Session ID>
```

Description

Terminates a web session.

```
admin web show
```

Syntax

```
admin web show [viewslmsessions <enable|disable>]
```

Description

Displays the current sessions and their ID.

Audit Log Commands

```
show auditlog
```

Syntax

```
show auditlog [command|user|clear] [email <Email Address>]
```

Description

Displays audit log. By default, shows the audit log sorted by date/time. You can sort it by user or command, or clear the audit log.

Authentication Commands

```
set auth
```

Syntax

```
set auth <one or more parameters>
```

Parameters

```
authusenextmethod <enable|disable>
kerberos <1-6>
ldap <1-6>
localusers <1-6>
nis <1-6>
```

```
      radius <1-6>
      tacacs+ <1-6>
```

Description

Sets ordering of authentication methods. Local Users authentication is always the first method used. Any methods omitted from the command are disabled.

```
show auth
```

Syntax

```
show auth
```

Description

Displays authentication methods and their order of precedence.

```
show user
```

Syntax

```
show user
```

Description

Displays attributes of the currently logged in user.

CLI Commands

```
set cli scscommands
```

Syntax

```
set cli scscommands <enable|disable>
```

Commands:

```
      info        direct <Device Port # or Name>
      version     listen <Device Port # or Name>
      reboot      clear <Device Port # or Name>
      poweroff    telnet <IP Address or Name>
      listdev     ssh <IP Address or Name>
```

Description

Allows you to use SCS-compatible commands as shortcuts for executing commands. Enabling this feature enables it only for the current cli session. It is disabled by default.

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

Description

Starts the menu if the menu associated with the current user does not display.

```
set cli menu
```

Syntax

```
set cli menu <start|menu name>
```

Description

Starts a menu if the menu associated with the user does not display.

```
set cli terminallines
```

Syntax

```
set cli terminallines <disable|Number of lines>
```

Description

Sets the number of lines in the terminal emulation screen for paging through text one screen at a time, if the SLC console manager cannot detect the size of the terminal automatically.

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

```
set history
```

Syntax

```
set history clear
```

Description

Clears the CLI commands history.

```
show history
```

Syntax

```
show history
```

Description

Displays the last 100 commands entered during a session.

Connection Commands

```
connect bidirection
```

Syntax

```
connect bidirection <Device Port # or Name> <endpoint> <one or more
parameters>
```

<endpoint> is one of:

```
      deviceport <Device Port # or Name>
      telnet <IP Address or Name> [port <TCP Port>]
      ssh <IP Address or Name> [port <TCP Port>] [<SSH flags>]
      tcp <IP Address> port <TCP Port>
      udp <IP Address> [port <UDP Port>]
```

Parameters

```
        exclusive <enable|disable>
        trigger <now|datetime|chars>
        date <MMDDYYhhmm[ss]>
        charcount <# of Chars>
        charseq <Char Sequence>
        charxfer <toendpoint|fromendpoint>
```

<SSH flags> is one or more of:

```
        user <Login Name>
        version <1|2>
        command <Command to Execute>
```

Note: *If the trigger is datetime (establish connection at a specified date/time), enter the date parameter. If the trigger is chars (establish connection on receipt of a specified number or characters or a character sequence), enter the charxfer parameter and either the charcount or the charseq parameter.*

connect direct

Syntax

```
connect direct <endpoint>
```

Parameters

```
        deviceport <Device Port # or Name>
        hostlist <Host List>
        ssh <IP Address or Name> [port <TCP Port>][<SSH flags>]
        tcp <IP Address> [port <TCP Port>]
        telnet <IP Address or Name> [port <TCP Port>]
        udp <IP Address> [port <UDP Port>
```

<SSH flags> is one or more of:

```
        user <Login Name>
        version <1|2>
        command <Command to Execute>
```

Description

Connects to a device port to monitor and/or interact with it, or establishes an outbound network connection.

connect listen

Syntax

```
connect listen <Device Port # or Name>
```

Description

Monitors a device port.

```
connect global outgoingtimeout
```

Syntax

```
connect global outgoingtimeout <disable|1-9999 seconds>
```

Description

Sets the amount of time the SLC console manager will wait for a response (sign of life) from an SSH/Telnet server that it is trying to connect to.

```
connect global show
```

Syntax

```
connect global show
```

Description

To display global connections.

```
connect script
```

Syntax

```
connect script <Script Name> deviceport <Device Port # or Name>
```

Description

Connect an interface script to a Device Port and run it.

```
connect terminate
```

Syntax

```
connect terminate <Connection ID List>
```

Description

Terminates a bidirectional or unidirectional connection.

```
connect unidirection
```

Syntax

```
connect unidirection <Device Port # or Name> dataflow
<toendpoint|fromendpoint> <endpoint> <one or more parameters>
```

<endpoint> is one of:

```
      deviceport <Device Port # or Name>
      telnet <IP Address or Name> [port <TCP Port>]
      ssh <IP Address or Name> [port <TCP Port>] [<SSH flags>]
      tcp <IP Address> port <TCP Port>
      udp <IP Address> port <UDP Port>
```

<SSH flags> is one or more of:

```
      user <Login Name>
      version <1|2>
      command <Command to Execute>
```

Parameters

```
      exclusive <enable|disable>
```

```
trigger <now|datetime|chars>
date <MMDDYYhhmm[ss]>
charcount <# of Chars>
charseq <Char Sequence>
```

Note: *If the trigger is datetime (establish connection at a specified date/time), enter the date parameter. If the trigger is chars (establish connection on receipt of a specified number or characters or a character sequence), enter either the charcount or the charseq parameter.*

Description

Connects a device port to another device port or an outbound network connection (data flows in one direction).

```
show connections
```

Syntax

```
show connections [email <Email Address>]
```

Description

Displays connections and their IDs. You can optionally email the displayed information. The connection IDs are in the left column of the resulting table. The connection ID associated with a particular connection may change if the connection times out and is restarted.

```
show connections connid
```

Syntax

```
show connections connid <Connection ID> [email <Email Address>]
```

Description

Displays details for a single connection. You can optionally email the displayed information.

Console Port Commands

```
set consoleport
```

Syntax

```
set consoleport <one or more parameters>
```

Parameters

```
baud <300-230400>
databits <7|8>
flowcontrol <none|xon/xoff|rts/cts>
group <Local or Remote Group Name>
parity <none|odd|even>
showlines <disable|1-50 lines>
stopbits <1|2>
timeout <disable|1-30 minutes>
```

The following list includes options which accept the CLEAR command:

Note: *CLEAR must be in all caps.*

set consoleport	group

Description

Configures console port settings.

```
show consoleport
```

Syntax

```
show consoleport
```

Description

Displays console port settings.

Custom User Menu Commands

Users can have custom user menus as their command line interface, rather than the standard CLI command set. Each custom user menu can contain up to 50 commands ('logout' is always the last command). Instead of typing each command, the user enters the number associated with the command. Each command can also have a nickname associated with it, which can be displayed in the menu instead of the command. The commands “showmenu <Menu Name>” and “returnmenu” can be entered to display another menu from a menu, or to return to the prior menu.

When creating a custom user menu, note the following limitations:

- Maximum of 20 custom user menus.
- Maximum of 50 commands per custom user menu (`logout` is always the last command).
- Maximum of 15 characters for menu names.
- Maximum of five nested menus can be called.
- No syntax checking. (Enter each command correctly.)

```
set cli menu
```

Syntax

```
set cli menu <start | Menu Name>
```

Description

Tests a CLI menu.

```
set localusers menu
```

Syntax

```
set localusers add|edit <User Login> menu <Menu Name>
```

Description

Assigns a custom user menu to a local user.

```
set menu add
```

Syntax

```
set menu add <Menu Name> [command <Command Number>]
```

Description

Creates a new custom user menu or adds a command to an existing custom user menu.

```
set menu copy
```

Syntax

```
set menu copy <Menu Name> newmenu <New Menu Name>
```

Description

Make a copy of an existing menu.

```
set menu edit
```

Syntax

```
set menu edit <Menu Name> <parameter>
```

Parameters

```
      command <Command Number>
      nickname <Command Number>
      redisplaymenu <enable|disable>
      shownicknames <enable|disable>
      title <Menu Title>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set menu edit	nickname

Description

Changes a command within an existing custom user menu, changes a nickname within an existing custom user menu, enables or disables the redisplay of the menu before each prompt, enables or disables the display of command nicknames instead of commands, and sets the optional title for a menu.

```
set menu delete
```

Syntax

```
set menu delete <Menu Name> [command <Command Number>]
```

Description

Deletes a custom user menu or one command within a custom user menu.

```
show menu
```

Syntax

```
show menu <all|Menu Name>
```

Description

Displays a list of all menu names or all commands for a specific menu.

Date and Time Commands

```
set datetime
```

Syntax

```
set datetime <one date/time parameter>
```

Parameters

```
      date <MMDDYYhhmm[ss]>
      timezone <Time Zone>
```

Note: *If you do not have a valid <Time Zone>, enter "timezone <invalid time zone>" and the system guides you through the process of selecting a time zone.*

Description

Sets the local date, time, and local time zone (one parameter at a time).

```
show datetime
```

Syntax

```
show datetime
```

Description

Displays the local date, time, and time zone.

```
set ntp
```

Syntax

```
set ntp <one or more parameters>
```

Parameters

```
      localserver1 <IP Address or Name>
      localserver2 <IP Address or Name>
      localserver3 <IP Address or Name>
      poll <local|public>
      publicserver <IP Address or Name>
      state <enable|disable>
      sync <broadcast|poll>
```

Description

Synchronizes the SLC console manager with a remote time server using NTP.

```
show ntp
```

Syntax

```
show ntp
```

Description

Displays NTP settings.

Device Commands

```
set command
```

Syntax

```
set command <Device Port # or Name or List> <one or more parameters>
```

Parameters

```
slp|servertech auth login <User Login>
slp|servertech config [prompt <Command Prompt>]
      [numoutlets <Number of Outlets>]
      [numexpoutlets <Number of Expansion Outlets>]
slp|servertech restart
slp|servertech outletcontrol state <on|off|cyclepower>
      [outlet <Outlet #>] [tower <A|B>]
slp|servertech outletstate [outlet <Outlet #>] [tower <A|B>]
slp|servertech envmon
slp|servertech infeedstatus
slp|servertech system
```

Description

Sends commands to (or control) a device connected to an SLC device port over the serial port.

Note: *Currently the only devices supported for this type of interaction are the SLP power manager, ServerTech CDU and Sensorsoft devices.*

Device Port Commands

```
set deviceport port
```

Syntax

```
set deviceport port <Device Port # or List or Name> <one or more
parameters>
```

Note: *An example would be* `set deviceport port 2-5,6,12,15-16 baud 2400`*.*

Parameters

```
auth <pap|chap>
banner <Banner Text>
baud <300-230400>
breakseq <1-10 Chars>
calleridcmd <Modem Command String>
calleridlogging <enable|disable>
```

```
cbcptype <admin|user>
cbcpnocallback <enable|disable>
chapauth <chaphost|localusers>
chaphost <CHAP Host or User Name>
chapsecret <CHAP Secret or User Password>
checkdsr <enable|disable>
closedsr <enable|disable>
databits <7|8>
device <none | slp8 | slp16 | slp8exp8 | slp8exp16 | slp16exp8 |
                              slp16exp16 | sensorsoft |
                              servertech>
dialbackdelay <PPP Dial-back Delay>
dialbacknumber <usernumber|Phone Number>
dialbackretries <1-10>
dialinlist <Host List for Dial-in>
dialoutlogin <User Login>
dialoutnumber <Phone Number>
dialoutpassword <Password>
dodauth <pap|chap>
dodchaphost <CHAP Host or User Name>
dodchapsecret <CHAP Secret or User Password>
emaildelay <Email Delay>
emaillogging <disable|bytecnt|charstr>
emailrestart <Restart Delay>
emailsend <email|trap|both>
emailstring <Regex String>
emailsubj <Email Subject>
emailthreshold <Threshold>
emailto <Email Address>
flowcontrol <none|xon/xoff|rts/cts>
initscript <Modem Initialization Script>
ipaddr <IP Address>
localipaddr <negotiate|IP Address>
locallogging <enable|disable>
logins <enable|disable>
maxdirect <1-10>
modemmode <text|ppp>
modemstate <disable | dialin | dialout | dialback | dialondemand |
                              dialin+ondemand | dialback+ondemand|
                              dialinhostlist | cbcpserver |
                              cbcpclient>
modemtimeout <disable|1-9999 seconds>
name <Device Port Name>
nat <enable|disable>
nfsdir <Logging Directory>
nfslogging <enable|disable>
nfsmaxfiles <Max # of Files>
nfsmaxsize <Size in Bytes>
parity <none|odd|even>
pccardlogging <enable|disable>
pccardmaxfiles <Max # of Files>
pccardmaxsize <Size in Bytes>
pcccardslot <upper|lower>
portlogseq <1-10 Chars>
remoteipaddr <negotiate|IP Address>
restartdelay <PPP Restart Delay>
showlines <disable|1-50 lines>
slmlogging <enable|disable>
slmnms <NMS IP Address>
slmthreshold <Threshold>
slmtime <Time Frame>
sshauth <enable|disable>
sshin <enable|disable>
sshport <TCP Port>
sshtimeout <disable|1-1800 seconds>
stopbits <1|2>
sysloglogging <enable|disable>
tcpauth <enable|disable>
tcpin <enable|disable>
tcpport <TCP Port>
tcptimeout <disable|1-1800 seconds>
telnetauth <enable|disable>
telnetin <enable|disable>
telnetport <TCP Port>
telnettimeout <disable|1-1800 sec>
timeoutlogins <disable|1-30 minutes>
usblogging <enable|disable>
```

```
        usbmaxfiles <Max # of Files>
        usbmaxsize <Size in Bytes>
        usbport <U1>
        usesites <enable|disable>
        viewportlog <enable|disable>
        webcolumns <Web SSH/Telnet Cols>
        webrows <Web SSH/Telnet Rows>
```

Note: *A group of device ports can be configured by specifying a comma-separated list of ports (i.e., '1-4,8,10-12') or 'ALL'. Remove breakseq for Device Ports connected to raw binary connections. The logging level for the Device Ports log must be set to 'Info' to view Syslog entries for Device Port logging. To send commands to devices such as SLP power manager and Sensorsoft, see the help for 'set command'.*

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set deviceports	dialinlist, nfsdir, nfsdir, breakseq, banner, group, portlogseq, chaphost, chapsecret, dodchaphost, dodchapsecret, initscript, dialoutlogin, dialoutpassword, dialbacknumber, emailsubj, emailstring, emailto

Description

Configures a single port or a group of ports.

```
set deviceport global
```

Syntax

```
set deviceport global <one or more parameters>
```

Parameters

```
        sshport <TCP Port>
        telnetport <TCP Port>
        tcpport <TCP Port>
```

Description

Configures settings for all or a group of device ports.

```
show deviceport global
```

Syntax

```
show deviceport global
```

Description

Displays global settings for device ports.

```
show deviceport names
```

Syntax

```
show deviceport names
```

Description

Displays a list of all device port names.

```
show deviceport port
```

Syntax

```
show deviceport port <Device Port List or Name> [display
<ip|data|modem|logging|device>]
```

Description

Displays the settings for one or more device ports.

```
show portcounters
```

Syntax

```
show portcounters [deviceport <Device Port List or Name>] [email <Email
Address>]
```

Description

Displays device port statistics and errors for one or more ports. You can optionally email the displayed information.

```
show portcounters zerocounters
```

Syntax

```
show portcounters zerocounters <Device Port List or Name>
```

Description

Zeros the port counters for one or more device ports.

```
show portstatus
```

Syntax

```
show portstatus [deviceport <Device Port List or Name>] [email <Email
Address>]
```

Description

Displays the modes and states of one or more device port(s). You can optionally email the displayed information.

Diagnostic Commands

```
diag arp
```

Syntax

```
diag arp [email <Email Address>]
```

Description

Displays the ARP table of IP address-to-hardware address mapping. You can optionally email the displayed information.

```
diag internals [email <Email Address>]
```

Syntax

```
diag internals
```

Description

Displays information on the internal memory, storage and processes of the SLC console manager.

```
diag lookup
```

Syntax

```
diag lookup <Name> [email <Email Address>]
```

Description

Resolves a host name into an IP address. You can optionally email the displayed information.

```
diag loopback
```

Syntax

```
diag loopback <Device Port Number or Name>[<parameters>]
```

Parameters

```
test <internal|external>
xferdatasize <Size In Kbytes to Transfer> (Default is 1 Kbyte.)
```

Description

Tests a device port by transmitting data out the port and verifying that it is received correctly. A special loopback cable comes with the SLC console manager. To test a device port, plug the cable into the device port and run this command. The command sends the specified Kbytes to the device port and reports success or failure. The test is performed at 9600 baud. Only an external test requires a loopback cable.

```
diag netstat
```

Syntax

```
diag netstat [protocol <all|tcp|udp>] [email <Email Address>]
```

Description

To display a report of network connections. You can optionally email the displayed information.

```
diag nettrace
```

Syntax

```
diag nettrace <one or more parameters>
```

Parameters

```
ethport <1|2>
host <IP Address or Name>
numpackets <Number of Packets>
```

```
      protocol <tcp|udp|icmp>
      verbose <low | medium | high | disable>
```

Description

Displays all network traffic, applying optional filters. This command is not available on the web page.

```
diag ping | ping6
```

Syntax

```
diag ping | ping6 <IP Address or Name> [<parameters>]
```

Parameters

```
      count <Number Of Times To Ping>
      packetsize <Size In Bytes>
      ethport <1|2>
```

Defaults

```
      count:5
      packetsize:64
```

Description

Verifies if the SLC console manager can reach a host over the network.

```
diag perfstat
```

Syntax

```
diag perfstat [ethport <1|2>] [deviceport <Device Port # or Name>]
```

Note: *You must specify an Ethernet Port or Device Port.*

Description

Displays performance statistics for an Ethernet Port or Device Port, averaged over the last 5 seconds.

```
diag sendpacket host
```

Syntax

```
diag sendpacket host <IP Address or Name> port <TCP or UDP Port Number>
[string <Packet String>] [protocol <tcp | udp>] [count <Number of
Packets>]
```

Defaults

```
      protocol:tcp
      count:1
```

Description

Generate and send Ethernet packets.

```
diag traceroute
```

Syntax

```
diag traceroute <IP Address or Name>
```

Description

Displays the route that packets take to get to a network host.

Email Log Commands

```
show emaillog
```

Syntax

```
show emaillog [email <Email Address>]
```

Description

Display the email log.

```
show emaillog clear
```

Syntax

```
show emaillog clear
```

Description

Clear the email log.

Events Commands

```
admin events add
```

Syntax

```
admin events add <trigger> <response>
```

<trigger> is one of:

```
      receivetrap, templimit, humidlimit or overcurrent
```

<response> is one of:

```
      action <syslog>

      action <fwdalltrapseth|fwdseltrapeth> ethport <1|2> nms <SNMP NMS>
            community <SNMP Community> [oid <SNMP OID>]

      action <fwdalltrapsmodem|fwdseltrapmodem> deviceport <Device Port
            # or Name> nms <SNMP NMS> community <SNMP Community> [oid
            <SNMP Trap OID>]

      action <fwdalltrapsmodem|fwdseltrapmodem> pccardslot <upper|lower>
            usbport <U1> nms <SNMP NMS> community <SNMP Community> [oid
            <SNMP Trap OID>]

      action <emailalert> emailaddress <destination email address>
```

Description

Adds SNMP event triggers and responses.

```
admin events delete
```

Syntax

```
admin events delete <Event ID>
```

Description

Deletes an event definition.

```
admin events edit
```

Syntax

```
admin events edit <Event ID> <parameters>
```

Parameters

```
      community <SNMP Community>
      deviceport <Device Port # or Name>
      ethport <1|2>
      nms <SNMP NMS>
      oid <SNMP Trap OID>
      usbport <U1>
      pccardslot <upper|lower>
      emailaddress <destination email address>
```

Description

Edits event definitions.

```
admin events show
```

Syntax

```
admin events show
```

Description

Displays event definitions.

Group Commands

```
set groups add|edit <Group Name> [<parameters>]
```

Syntax

```
set groups add|edit <Group Name> [<parameters>]
```

Parameters:

```
dataports <Port List>
listenports <Port List>
clearports <Port List>
accessoutlets <Outlet List>
escapeseq <1-10 Chars>
breakseq <1-10 Chars>
custommenu <Menu Name>
displaymenu <enable|disable>
```

```
allowdialback <enable|disable>
dialbacknumber <Phone Number>
permissions <Permission List>
```

Note: *See 'help user permissions' for information on user rights.*

```
set groups rename
```

Syntax

```
set groups rename <Group Name> newname <New Group Name>
```

Description

Renames the name of the group.

```
set groups delete
```

Syntax

```
set groups delete <Group Name>
```

Description

Deletes a group. All members must be removed from a group before it can be deleted.

```
show group
```

Syntax

```
show groups [name <Group Name>] members <enable|disable>
```

Description

Displays all groups or a specific group. The members of the group(s) can optionally be displayed.

The following list includes options which accept the `CLEAR` command.

Note: `CLEAR` *must be in all caps.*

`set groups`	`custommenu, escapeseq, breakseq, dialbacknumber, outletlist, listenports, dataports, clearports`

Host List Commands

```
set hostlist (name)
```

Syntax

```
set hostlist add|edit <Host List Name> [<parameters>]
```

Parameters

```
      name <Host List Name> (edit only)
      retrycount <1-10> (Default is 3.)
      auth <enable|disable>
```

Description

Configures a prioritized list of hosts to be used for modem dial-in connections.

```
set hostlist (number)
```

Syntax

```
set hostlist add|edit <Host List Name> entry <Host Number>
[<parameters>]
```

Parameters

```
      host <IP Address or Name>
      protocol <ssh|telnet|tcp>
      port <TCP Port>
      escapeseq <1-10 Chars>
```

Description

Adds a new host entry to a list or edit an existing entry.

```
set hostlist delete
```

Syntax

```
set hostlist delete <Host List> [entry <Host Number>]
```

Description

Deletes a host list, or a single host entry from a host list.

```
set hostlist edit
```

Syntax

```
set hostlist edit <Host List Name> move <Host Number> position <Host
Number>
```

Description

Moves a host entry to a new position in the host list.

```
show hostlist
```

Syntax

```
show hostlist <all|names|Host List Name>
```

Description

Displays the members of a host list.

IP Filter Commands

```
set ipfilter mapping
```

Syntax

```
set ipfilter mapping <parameters>
```

Parameters

```
      ethernet <1|2> state <disable>
      ethernet <1|2> state <enable> ruleset <Ruleset Name>
      deviceport <1..48> state <disable>
      deviceport <1..48> state <enable> ruleset <Ruleset Name>
      pccardslot <upper|lower> state <disable>
      pccardslot <upper|lower> state <enable> ruleset <Ruleset Name>
      usbport <U1> state <disable>
      usbport <U1> state <enable> ruleset <Ruleset Name>
```

Description

Maps an IP filter to an interface.

```
set ip filter rules
```

Syntax

```
set ipfilter rules <parameters>
```

Parameters:

```
      add <Ruleset Name>
      delete <Ruleset Name>
      edit <Ruleset Name> <Edit Parameters>
      append
      insert <Rule Number>
      replace <Rule Number>
      delete <Rule Number>
```

Description

Sets IP filter rules.

```
set ipfilter state
```

Syntax

```
set ipfilter state <enable|disable> [testtimer <disable|1-120 minutes>]
```

Description

Enables or disables IP filtering for incoming network traffic.

```
show ipfilter
```

Syntax

```
show ipfilter
```

Description

Displays IP filters.

show ipfilter mapping

Syntax

```
show ipfilter mapping
```

Description

Displays the IP filter mapping.

```
show ipfilter ruleset
```

Syntax

```
show ipfilter ruleset <all|Ruleset Name>
```

Description

Displays the rulesets for the IP filters.

```
show ipfilter status
```

Syntax

```
show ipfilter status <all|Ruleset Name>
```

Description

Displays the IP filter status.

Kerberos Commands

```
set kerberos
```

Syntax

```
set kerberos <one or more parameters>
```

Parameters

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
custommenu <Menu Name>
allowdialback <enable|disable>
dialbacknumber <Phone Number>
dataports <Port List>
escapeseq <1-10 Chars>
group <default|power|admin>
ipaddr <Key Distribution Center IP Address>
kdc <Key Distribution Center>
listenports <Port List>
```

```
        port <Key Distribution Center TCP Port>
        realm <Kerberos Realm>
        state <enable|disable>
        useldapforlookup <enable|disable>
        permissions <Permission List>
```

The following list includes options which accept the CLEAR command:

Note: CLEAR *must be in all caps*.

set kerberos	realm, kdc, custommenu, escapeseq, breakseq, dialbacknumber, accessoutlets, listenports, dataports, clearports

Description

Configures the SLC console manager to use Kerberos to authenticate users who log in via the Web, SSH, Telnet, or the console port.

```
show kerberos
```

Syntax

```
show kerberos
```

Description

Displays Kerberos settings.

LDAP Commands

```
set ldap
```

Syntax

```
set ldap <one or more parameters>
```

Parameters

```
        accessoutlets <Outlet List>
        adsupport <enable|disable>
        base <LDAP Base>
        bindname <Bind Name>
        bindpassword <Bind Password>
        bindwithlogin <enable|disable>
        useldapschema <enable|disable>
        breakseq <1-10 Chars>
        clearports <Port List>
        custommenu <Menu Name>
        allowdialback <enable|disable>
        dialbacknumber <Phone Number>
        dataports <Ports List>
        encrypt <starttls|ssl|disable>
        escapeseq <1-10 Chars>
        filteruser <User Login Attribute>
        filtergroup <Group Objectclass>
        grmemberattr <Group Membership Attribute>
        grmembervalue <dn|name>
        group <default|power|admin>
        listenports <Port List>
        permissions <Permission List>
        port <TCP Port> (Default is 389.)
        server <IP Address or Hostname>
        state <enable|disable>
```

The following list includes options which accept the CLEAR command:

Note: CLEAR *must be in all caps.*

set ldap	custommenu, escapeseq, breakseq, dialbacknumber, base, bindname, bindpassword, filteruser, filtergroup, grmemberattr, accessoutlets, listenports, dataports, clearports

Description

Configures the SLC console manager to use LDAP to authenticate users who log in via the Web, SSH, Telnet, or the console port.

```
show ldap
```

Syntax

```
show ldap
```

Description

Displays LDAP settings.

Local Users Commands

```
set localusers
```

Syntax

```
set localusers add|edit <User Login> <one or more parameters>
```

Parameters

```
        uid <User Identifier>
        accessoutlets <Outlet List>
```

```
allowdialback <enable|disable>
breakseq <1-10 Chars>
changenextlogin <enable|disable>
changepassword <enable|disable>
clearports <Port List>
custommenu <Menu Name>
dataports <Port List>
dialbacknumber <Phone Number>
displaymenu <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin|Custom Group Name>
listenports <Port List>
passwordexpires <enable|disable>
permissions <Permission List>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set localusers	custommenu, escapeseq, breakseq, dialbacknumber, accessoutlets, listenports, dataports, clearports

Description

Configures local accounts including sysadmin who log in to the SLC console manager by means of the Web, SSH, Telnet, or the console port.

```
set localusers allowreuse
```

Syntax

```
set localusers allowreuse <enable|disable>
```

Description

Sets whether a login password can be reused.

```
set localusers complexpasswords
```

Syntax

```
set localusers complexpasswords <enable|disable>
```

Description

Sets whether a complex login password is required.

```
set localusers consoleonlyadmin
```

Syntax

```
set localusers consoleonlyadmin <enable|disable>
```

Description

```
Sets console-only admin usage.
```

```
set localusers delete
```

Syntax

```
set localusers delete <User Login>
```

Description

Deletes a local user.

```
set localusers lifetime
```

Syntax

```
set localusers lifetime <Number of Days>
```

Description

Sets the number of days the login password may be used. The default is 90 days.

```
set localusers lock
```

Syntax

```
set localusers lock|unlock <User Login>
```

Description

Allows or blocks a user login.

```
set localusers maxloginattempts
```

Syntax

```
set localusers maxloginattempts <Number of Logins>
```

Description

Sets the maximum number of login attempts before the account is locked. Disabled by default.

```
set localusers multipleadminlogins
```

Syntax

```
set localusers multipleadminlogins <enable|disable>
```

Description

Sets multiple admin logins.

```
set localusers password
```

Syntax

```
set localusers password <User Login>
```

Description

Sets a login password for the local user.

```
set localusers periodlockout
```

Syntax

```
set localusers periodlockout <Number of Minutes>
```

Description

Sets the number of minutes after a lockout before the user can try to log in again. Disabled by default.

```
set localusers periodwarning
```

Syntax

```
set localusers periodwarning <Number of Days>
```

Description

Sets the number of days the system warns the user that the password will be expiring. The default is 7 days.

```
set localusers reusehistory
```

Syntax

```
set localusers reusehistory <Number of Passwords>
```

Description

Sets the number of passwords the user must use before reusing an old password. The default is 4.

```
set localusers state
```

Syntax

```
set localusers state <enable|disable>
```

Description

Enables or disables authentication of local users.

```
show localusers
```

Syntax

```
show localusers [user <User Login>]
```

Description

Displays local users.

Log Commands

```
set log clear
```

Syntax

```
set log clear <Device Port # or Name>
```

Description

Clears the Device Port local buffer. Local logging must be enabled for a Device Port in order to use this command.

```
set log clear modem
```

Syntax

```
set log clear modem
```

Description

Clears the modem log the modem log is automatically pruned when it reaches 50K.

```
set log modem pppdebug
```

Syntax

```
set log modem pppdebug <enable|disable>
```

Description

Enables PPP debugging in the modem log. When enabled, performance could be impacted.

```
show log files
```

Syntax

```
show log files nfs | pccard | usb [locdir <NFS Mount Local
Directory>][pccardslot <upper|lower>] [usbport <U1>] [deviceport <Device
Port # or Name>]
```

Description

Lists the NFS, USB, or PC Card log files, either for a specific Device Port, or all log files in a PC Card or NFS location.

```
show log local
```

Syntax

```
show log local |nfs | pccard <Device Port # or Name> [<parameters>]
```

Parameters

```
      display <head|tail>
      numlines <Number of Lines>
      bytes <Bytes to Display>
      startbyte <Byte Index>
      logfile <NFS or PC Card Log File>
```

Defaults

```
      bytes:1000
      startbyte:1
      numlines:40
```

Description

Views the log for local, NFS, or PC card logging. NFS and PC card use the current logging settings for the device port. The default is to show the tail of the log.

```
show log modem
```

Syntax

```
show log modem [display <head|tail>] [numlines <Number of Lines>]
```

Description

View the modem activity log for external modems and PC Card modems.

Network Commands

```
set network
```

Syntax

```
set network <parameters>
```

Parameters

```
      interval <1-99999 Seconds>
      ipforwarding <enable|disable>
      probes <Number of Probes>
      startprobes <1-99999 Seconds>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set network	domain

Description

Sets TCP Keepalive and IP Forwarding network parameters.

```
set network bonding
```

Syntax

```
set network bonding <disabled|active-backup|802.3ad|load-balancing>
```

Description

Configures ethernet bonding.

```
set network dns
```

Syntax

```
set network dns <1|2|3> ipaddr <IP Address>
```

Description

```
Configures up to three DNS servers.
```

```
set network gateway
```

Syntax

```
set network gateway <parameters>
```

Parameters

```
      default <IP Address>
      precedence <dhcp|gprs|default>
      alternate <IP Address>
      pingip <IP Address>
      ethport <1 | 2>
      pingdelay <1-250 seconds>
      failedpings <1-250>
```

Description

Sets default and alternate gateways. The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

```
set network host
```

Syntax

```
set network host <Hostname> [domain <Domain Name>]
```

Description

Sets the SLC host name and domain name.

```
set network ipv6
```

Syntax

```
set network ipv6 <enable|disable>
```

Description

Enables or disables IPv6 networking.

```
set network port
```

Syntax

```
set network port <1|2> <parameters>
```

Parameters

```
      mode <auto|10mbit-half|100mbit-half|10mbit-full|100mbit-full>
      state <dhcp|bootp|static|disable>
      [ipaddr <IP Address> mask <Mask>]
      [ipv6addr <IP v6 Address/Prefix>]
      mtu <Maximum Transmission Unit>
```

Description

Configures Ethernet port 1 or 2.

```
show network all
```

Syntax

```
show network all
```

Description

Displays all network settings.

```
show network bonding
```

Syntax

```
show network bonding
```

Description

Displays network connections that are bonded.

```
show network dns
```

Syntax

```
show network dns
```

Description

Displays DNS settings.

```
show network gateway
```

Syntax

```
show network gateway
```

Description

Displays gateway settings.

```
show network host
```

Syntax

```
show network host
```

Description

Displays the network host name of the SLC console manager.

```
show network port
```

Syntax

```
show network port <1|2>
```

Description

Displays Ethernet port settings and counters.

NFS and SMB/CIFS Commands

```
set cifs
```

Syntax

```
set cifs <one or more parameters>
```

Parameters

```
      eth1 <enable|disable>
      eth2 <enable|disable>
      state <enable|disable>
      workgroup <Windows workgroup>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set cifs	workgroup

Description

Configures the SMB/CIFS share, which contains the system and device port logs.

Note: *The* `admin config` *command saves SLC configurations on the SMB/CIFS share.*

```
set cifs password
```

Syntax

```
set cifs password
```

Description

Changes the password for the SMB/CIFS share login (default is cifsuser).

```
set nfs mount
```

Syntax

```
set nfs mount <1|2|3> <one or more parameters>
```

Parameters

```
      remdir <NFS Share>
      locdir <Directory>
      rw <enable|disable>
      mount <enable|disable>
```

Note: *Specification of rmdir and locdir parameters are required. Once specified, the parameters do not need to be re-specified.*

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

`set nfs`	`remdir, locdir`

Description

Mounts a remote NFS share. The `remdir` and `locdir` parameters are required, but if they have been specified previously, you do not need to provide them again.

```
set nfs unmount
```

Syntax

```
set nfs unmount <1|2|3>
```

Description

Unmounts a remote NFS share.

```
show cifs
```

Syntax

```
show cifs
```

Description

Displays SMB/CIFS settings.

```
show nfs
```

Syntax

```
show nfs
```

Description

Displays NFS share settings.

NIS Commands

```
set nis
```

Syntax

```
set nis <one or more parameters>
```

Parameters

```
      accessoutlets <Outlet List>
      breakseq <1-10 Chars>
      broadcast <enable|disable>
      clearports <Port List>
      custommenu <Menu Name>
      allowdialback <enable|disable>
      dialbacknumber <Phone Number>
      dataports <Port List>
      domain <NIS Domain Name>
      escapeseq <1-10 Chars>
      group <default|power|admin>
      listenports <Port List>
      master <IP Address or Hostname>
      permissions <Permission List>
      slave1 <IP Address or Hostname>
      slave2 <IP Address or Hostname>
      slave3 <IP Address or Hostname>
      slave4 <IP Address or Hostname>
      slave5 <IP Address or Hostname>
      state <enable|disable>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set nis	custommenu, escapeseq, breakseq, dialbacknumber, domain, accessoutlets, listenports, dataports, clearports

Description

Configures the SLC console manager to use NIS to authenticate users who log in via the Web, SSH, Telnet, or the console port.

```
show nis
```

Syntax

```
show nis
```

Description

Displays NIS settings.

PC Card Commands

```
pccard modem
```

Syntax

```
pccard modem <upper|lower> <parameters>
```

Parameters

```
auth <pap|chap>
baud <300-115200> (Default is 9600)
cbcpnocallback <enable|disable>
cbcptype <admin|user>
calleridcmd <Modem Command String>
calleridlogging <enable|disable>
chaphost <CHAP Host or User Name>
chapauth <chaphost|localusers>
chapsecret <CHAP Secret or User Password>
databits <7|8>
dialbackdelay <PPP Dialback Delay>
dialbacknumber <usernumber|Phone Number>
dialbackretries <1-10>
dialinlist <Host List for Dial-in>
dialoutlogin <User Login>
dialoutnumber <Phone Number>
dialoutpassword <Password>
```

```
dodauth <pap|chap>
dodchaphost <CHAP Host or User Name>
dodchapsecret <CHAP Secret or User Password>
flowcontrol <none|xon/xoff|rts/cts>
gsmautodns <enable|disable>
gsmbearerservice <GSM Bearer Service>
gsmcompression <enable|disable>
gsmcontext <GPRS Context Id>
gsmdialoutmode <gprs|gsm>
gsmpin <GSM/GPRS PIN Number>
initscript <Modem Initialization Script>
isdnchannel <1|2>
isdnnumber <Phone Number>
localipaddr <negotiate|IP Address>
modemmode <text|ppp>
modemstate <disable | dialin | dialout | dialback | cbcpserver |
                              cbcpclient | dialondemand |
                              dialin+ondemand | dialback+ondemand
                              | dialinhostlist>
modemtimeout <disable|1-9999 sec>
nat <enable|disable>
parity <none|odd|even>
remoteipaddr <negotiate|IP Address>
restartdelay <PPP Restart Delay>
service <none|telnet|ssh|tcp>
sshauth <enable|disable>
sshport <TCP Port>
stopbits <1|2>
tcpauth <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable|1-30 minutes>
```

Note: *Dial-out GPRS connections may replace the default route and DNS entries. Static routes (see* `set routing`*) may be required to maintain access to subnets that are not directly attached to the SLC console manager. It is recommended that the initscript be prepended with AT and include E1 V1 x4 Q0 so that the SLC device may properly control the modem.*

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps*

`pccard modem`	`dialinlist, chaphost, chapsecret, dodchaphost, dodchapsecret, initscript, dialoutlogin, dialoutpassword, dialbacknumber, group`

Description

Configures a currently loaded PC Card.

```
pccard storage copy
```

Syntax

```
pccard storage copy <upper|lower> file <Filename> newfile <New Filename>
```

Description

Copies a file on a Compact Flash card.

```
pccard storage delete
```

Syntax

```
pccard storage delete <upper|lower> file <Current Filename>
```

Description

Removes a file on a Compact Flash card.

```
pccard storage dir
```

Syntax

```
pccard storage dir <upper|lower>
```

Description

Views a directory listing of a Compact Flash card.

```
pccard storage format
```

Syntax

```
pccard storage format <upper|lower> [filesystem <ext2|fat>]
```

Description

Formats a Compact Flash card.

```
pccard storage mount
```

Syntax

```
pccard storage mount <upper|lower>
```

Description

Mounts a Compact Flash card in the SLC console manager for use as a storage device. The Compact Flash card must be formatted with an ext2 or FAT file system before you mount it.

```
pccard storage rename
```

Syntax

```
pccard storage rename <upper|lower> file <Filename> newfile <New
Filename>
```

Description

To rename a file on a Compact Flash card.

```
pccard storage unmount
```

Syntax

```
pccard storage unmount <upper|lower>
```

Description

Unmounts a Compact Flash card. Enter this command before ejecting the card.

```
show pccard
```

Syntax

```
show pccard
```

Description

Displays currently loaded PC cards with product information and settings.

```
show pccard storage
```

Syntax

```
show pccard storage
```

Description

Displays product information and settings for any PC card compact flash.

```
show pccard modem
```

Syntax

```
show pccard modem
```

Description

Displays product information and settings for any PC card modem.

RADIUS Commands

```
set radius
```

Syntax

```
set radius <one or more parameters>
```

Parameters

```
      accessoutlets <Outlet List>
      breakseq <1-10 Chars>
      clearports <Port List>
      custommenu <Menu Name>
      allowdialback <enable|disable>
      dialbacknumber <Phone Number>
      dataports <Port List>
      escapeseq <1-10 Chars>
      group <default|power|admin>
      listenports <Port List>
      state <enable|disable>
      permissions <Permission List>
      timeout <enable|1-30 seconds>
      usevsa <enable|disable>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set radius	custommenu, escapeseq, breakseq, dialbacknumber, secret, accessoutlets, listenports, dataports, clearports

Description

Configures the SLC console manager to use RADIUS to authenticate users who log in via the Web, SSH, Telnet, or the console port.

```
set radius server
```

Syntax

```
set radius server <1|2> host <IP Address or Hostname> secret <Secret>
[port <TCP Port>]
```

Description

Identifies the RADIUS server, the text secret, and the TCP port number.

Note: *The default port is 1812.*

```
show radius
```

Syntax

```
show radius
```

Description

Displays RADIUS settings.

Remote Users Commands

```
set remoteusers
```

Syntax

```
set remoteusers add|edit <User Login> [<parameters>]
```

Parameters

```
      accessoutlets <Outlet List>
      allowdialback <enable|disable>
      breakseq <1-10 Chars> listenports <Port List>
      clearports <Port List>
      custommenu <Menu Name>
      dataports <Port List>
      dialbacknumber <Phone Number>
      displaymenu <enable|disable>
      escapeseq <1-10 Chars>
      group <default|power|admin|Custom Group Name>
      permissions <Permissions List>
```

where <Permission List> is one or more of:

```
      nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad, do, ub,
      po
```

Note: *To remove a permission, type a minus sign before the two-letter abbreviation for a user right.*

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

`set remoteusers`	`custommenu, escapeseq, breakseq, dialbacknumber, accessoutlets, listenports, dataports, clearports`

Description

Sets attributes for users who log in by a remote authentication method.

```
set remoteusers delete
```

Syntax

```
set remoteusers delete <User Login>
```

Description

Removes a remote user.

```
set remoteusers listonlyauth
```

Syntax

```
set remoteusers listonlyauth <enable|disable>
```

Description

Sets whether remote users who are not part of the remote user list will be authenticated.

```
show remoteusers
```

Syntax

```
show remoteusers
```

Description

Displays settings for all remote users.

Routing Commands

```
set routing
```

Syntax

```
set routing [parameters]
```

Parameters

```
rip <enable|disable>
route <1-64> ipaddr <IP Address> mask <Netmask> gateway <IP
Address>
static <enable|disable>
version <1|2|both>
```

Note: *To delete a static route, set the ipaddr, mask, and gateway to 0.0.0.0.*

Description

Configures static or dynamic routing. To delete a static route, set the IP address, mask, and gateway parameters to 0.0.0.0.

```
show routing
```

Syntax

```
show routing [sort <destination|iface>] [display <IP Address>]
[resolveip <enable|disable>] [email <Email Address>]
```

Description

Sets the routing table to display IP addresses (disable) or the corresponding host names (enable). You can email the displayed information.

Script Commands

```
set script delete
```

Syntax

```
set script delete <interface|batch> name <Script Name>
```

Description

Delete a script.

```
set script import
```

Syntax

```
set script import <interface|batch> via <ftp|scp|copypaste> [file
<Script File>] [name <Script Name>] [host <IP Address or Name>] [login
<User Login>] [path <Path to Script File>]
```

Note: *Interface scripts have default/do user rights. Batch scripts have admin/ad user rights. The script name is the same as the file name (if it is a valid script name), otherwise a script name must be specified for import.*

Description

Import a script.

```
set script rename
```

Syntax

```
set script rename <interface|batch> name <Script Name> newname <New
Script Name>
```

Description

Rename a script.

```
set script runcli
```

Syntax

```
set script runcli <Script Name>
```

Description

Run a CLI batch script.

```
set script update
```

Syntax

```
set script update <interface|batch> name <Script Name> [group
<default|power|admin>] [permissions <Permission List>]
```

Description

Updates a script.

```
show script
```

Syntax

```
show script [type <interface|batch> [name <Script Name>]]
```

Description

Display list of Device Port (interface) scripts or CLI (batch) scripts, or view the contents of a script.

Services Commands

```
set services
```

Syntax

```
set services <one or more services parameters>
```

Parameters

```
alarmdelay <1-6000 Seconds>
auditlog <enable|disable>
auditsize <1-500 Kbytes>
authlog <off|error|warning|info|debug>
clicommands <enable|disable>
contact <Admin Contact Info>
devlog <off|error|warning|info|debug>
diaglog <off|error|warning|info|debug>
genlog <off|error|warning|info|debug>
includesyslog <enable|disable>
javabufsize <Number of Lines>
javaterminal <jws|applet>
location <Physical Location>
netlog <off|error|warning|info|debug>
nms1 <IP Address or Name>
nms2 <IP Address or Name>
outgoingtelnet <enable|disable>
phoneip <IP Address>
phonehome <enable|disable>
portssh <TCP Port>
rocommunity <Read-Only Community>
rwcommunity <Read-Write Community>
servlog <off|error|warning|info|debug>
smtpsender <Email Address>
smtpserver <IP Address or Name>
snmp <enable|disable>
ssh <enable|disable>
syslogserver1 <IP Address or Name>
syslogserver2 <IP Address or Name>
telnet <enable|disable>
timeoutssh <disable|1-30 minutes>
timeouttelnet <disable|1-30 minutes>
```

```
traps <enable|disable>
trapcommunity <Trap Community>
v1ssh <enable|disable>
v1v2 <enable|disable>
v3auth <md5|sha>
v3encrypt <des|aes>
v3password <V3 RO User Password>
v3phrase <V3 RO User Passphrase>
v3rwpassword <V3 RW User Password>
v3rwphrase <V3 RW User Passphrase>
v3rwuser <V3 RW User>
v3security <noauth|auth|authencrypt>
v3user <V3 RO User>
webssh <enable|disable>
webtelnet <enable|disable>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

set services	location, contact, v3phrase, v3rwphrase, phonenumber

Description

Configures services (system logging, SSH and Telnet access, SSH and Telnet timeout, SNMP agent, email (SMTP) server, and audit log). Sets a password for an SNMP manager to access the read-only data the SLC SNMP agent provides and to modify data when permitted.

```
set services trapenable
```

Syntax

```
set services trapenable
```

Description

Defines the set of SNMP traps that are sent by the SLC console manager.

```
show services
```

Syntax

```
show services
```

Description

Displays current services.

Site Commands

To create or edit a site:

```
set site add|edit <Site Name> [<parameters>]
```

Parameters:

```
name <Site Name> (edit only)          dialoutnumber <Phone Number>
deviceport <Device Port # or Name or none>  dialoutlogin <User Login>
usbport <U1|U2>                       dialoutpassword <Password>
auth <pap|chap>                       allowdialback <enable|disable>
pccardslot <upper|lower>              loginhost <User Login/CHAP Host>
dialbacknumber <Phone Number>         chapsecret <CHAP Secret>
dialbackdelay <Dial-back Delay>       localipaddr <negotiate|IP Address>
dialbackretries <1-10>                remoteipaddr <negotiate|IP Address>
timeoutlogins <disable|1-30 minutes>  routeipaddr <IP Address>
modemtimeout <disable|1-9999 secs>    routemask <Mask>
restartdelay <PPP Restart Delay>       routegateway <Gateway>
cbcpnocallback <enable|disable>        nat <enable|disable>
```

To delete a site:

```
set site delete <Site Name>
show site <all|names|Site Name>
```

The following list includes options which accept the `CLEAR` command:

`CLEAR` *must be in all caps.*

set sites	loginhost, chapsecret, dialoutlogin, dialoutpassword, dialbacknumber

SLC Network Commands

```
set slcnetwork
```

Syntax

```
set slcnetwork <parameters>
```

Parameters

```
    add <IP Address>
    delete <IP Address>
    search <localsubnet|ipaddrlist|both>
```

Description

Detects and displays all SLC console manager or user-defined IP addresses on the local network.

```
show slcnetwork
```

Syntax

```
show slcnetwork[ipaddrlist <all|Address Mask>]
```

Description

Detects and displays all SLC console managers on the local network. Without the `ipaddrlist` parameter, the command searches the SLC network. With the `ipaddrlist` parameter, the command displays a sorted list of all IP addresses or displays the IP addresses that match the mask (for example, 172.19.255.255 would display all IP addresses that start with 172.19).

SSH Key Commands

```
set sshkey allexport
```

Syntax

```
set sshkey allexport <ftp|scp|copypaste> [pubfile <Public Key File>]
[host <IP Address or Name>] [login <User Login>] [path <Path to Copy
Keys>]
```

Description

Exports the public keys of all previously created SSH keys.

```
set sshkey delete
```

Syntax

```
set sshkey delete <one or more parameters>
```

Parameters

```
keyhost <SSH Key Host>
keyname <SSH Key Name>
keyuser <SSH Key User>
```

Description

Deletes an ssh key. Specify the `keyuser` and `keyhost` to delete an imported key; specify the `keyuser` and `keyname` to delete exported key.

```
set sshkey export
```

Syntax

set sshkey export <ftp|scp|**copypaste**> <one or more parameters>

Parameters

[format <**openssh**|secsh>]

[host <IP Address or Name>]

[login <User Login>]

[path <Path to Copy Key>]

[bits <1024 | 2048>]

keyname <SSH Key Name>

keyuser <SSH Key User>

type <**rsa**|dsa>

Description

Exports an sshkey. RSA keys must be 1024 or 2048 bits.

```
set sshkey import
```

Syntax

```
set sshkey import <ftp|scp|copypaste> [file <Public Key File>] [host <IP
Address or Name>] [login <User Login>] [path <Path to Public Key File>]
[keyuser <SSH Key User>] [keyhost <SSH Key IP Address or Name>]
```

Note: *The key file may contain multiple keys; in this case the keyuser and keyhost will be ignored.*

Description

Imports an SSH key.

```
set sshkey server import
```

Syntax

```
set sshkey server import type <rsa1|rsa|dsa> via <sftp|scp> pubfile
<Public Key File> privfile <Private Key File> host <IP Address or Name>
login <User Login> [path <Path to Key File>]
```

Description

Imports an SLC host key.

```
set sshkey server reset
```

Syntax

```
set sshkey server reset [type <all|rsa1|rsa|dsa>]
```

Description

Resets defaults for all or selected host keys.

```
show sshkey export
```

Syntax

```
show sshkey export <one or more parameters>
```

Parameters

```
      [keyhost <SSH Key IP Address or Name>]
      [keyuser <SSH Key User>]
      [viewkey <enable|disable>]
```

Description

Displays all exported keys or keys for a specific user, IP address, or name.

```
show sshkey import
```

Syntax

```
show sshkey import <one or more parameters>]
```

Parameters

```
      [keyhost <SSH Key IP Address or Name>]
      [keyuser <SSH Key User>]
      [viewkey <enable|disable>]
```

Description

Displays all keys that have been imported or keys for a specific user, IP address, or name.

```
show sshkey server
```

Syntax

```
show sshkey server [type <all|rsa1|rsa|dsa>]
```

Description

Displays host keys (public key only).

Status Commands

```
show sysconfig
```

Syntax

```
show sysconfig [display <basic|auth|devices>] [email <Email Address]
```

Description

Displays a snapshot of all configurable parameters. Optionally emails the displayed information.

```
show sysstatus
```

Syntax

```
show sysstatus [email <Email Address>]
```

Description

To display the overall status of all SLC devices. Optionally emails the displayed information.

System Log Commands

```
show syslog
```

Syntax

```
show syslog [<parameters>]
```

Parameters

```
email <Email Address>]
level <error|warning|info|debug>
log <all|netlog|servlog|authlog|devlog|diaglog|genlog>
display <head|tail> [numlines <Number of Lines>]
starttime <MMDDYYhhmm[ss]>
endtime <MMDDYYhhmm[ss]>
```

Description

Displays the system logs containing information and error messages.

Note: The level and display parameters cannot be used simultaneously.

```
show syslog clear
```

Syntax

```
show syslog clear <all|netlog|servlog|authlog|devlog|diaglog|genlog>
```

Description

Clears one or all of the system logs.

TACACS+ Commands

```
set tacacs+
```

Syntax

```
set tacacs+ <one or more parameters>
```

Parameters

```
accessoutlets <Outlet List>
breakseq <1-10 Chars>
clearports <Port List>
custommenu <Menu Name>
allowdialback <enable|disable>
dialbacknumber <Phone Number>
dataports <Port List>
encrypt <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin>
listenports <Port List>
permissions <Permission List>
secret <TACACS+ Secret>
server1 <IP Address or Name>
server2 <IP Address or Name>
server3 <IP Address or Name>
state <enable|disable>
```

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

`set tacacs+`	`custommenu, escapeseq, breakseq, dialbacknumber, secret, accessoutlets, listenports, dataports, clearports`

Description

Configures the SLC console manager to use TACACS+ to authenticate users who log in via the Web, SSH, Telnet, or the console port.

```
show tacacs+
```

Syntax

```
show tacacs+
```

Description

Displays TACACS+ settings.

Temperature Commands

```
set temperature
low <Low Temperature in C. or F.>
high <High Temperature in C. or F.>
calibrate <Temperature Calibration in C. or F.|cancel>
```

Syntax

```
set temperature low <Low Temperature in C> high <High Temperature in C>
```

Description

Sets the acceptable range for the internal temperature sensor (an SNMP trap is sent if the temperature is outside of this range).

```
show temperature
```

Syntax

```
show temperature
```

Description

Displays the acceptable range and the current reading from the internal temperature sensor.

USB Commands

```
set usb access
```

Syntax

```
set usb access <enable | disable>
```

Description

Enables or disables access to USB devices.

```
set usb modem
```

Syntax

```
set usb modem <U1> <parameters>
```

Parameters

```
auth <pap|chap>
baud <300-115200>
calleridcmd <Modem Command String>
calleridlogging <enable|disable>
cbcpnocallback <enable|disable>
cbcptype <admin|user>
chapauth <chaphost|localusers>
chaphost <CHAP Host or User Name>
chapsecret <CHAP Secret or User Password>
databits <7|8>
dialbackdelay <PPP Dialback Delay>
dialbacknumber <usernumber|Phone Number>
dialbackretries <1-10>
dialinlist <Host List for Dial-in>
dialoutlogin <User Login>
dialoutnumber <Phone Number>
dialoutpassword <Password>
dodauth <pap|chap>
dodchaphost <CHAP Host or User Name>
dodchapsecret <CHAP Secret or User Password> restartdelay <PPP
Restart Delay>
flowcontrol <none|xon/xoff|rts/cts>
initscript <Modem Init Script>
localipaddr <negotiate|IP Address>
modemmode <text|ppp>
modemstate <disable | dialin | dialout | dialback | cbcpserver |
cbcpclient | dialondemand |dialin+ondemand | dialinhostlist>
modemtimeout <disable|1-9999 sec>
nat <enable|disable>
parity <none|odd|even>
remoteipaddr <negotiate|IP Address>
service <none|telnet|ssh|tcp>
sshauth <enable|disable>
sshport <TCP Port>
stopbits <1|2>
tcpauth <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable|1-30 minutes>
```

```
    usesites <enable|disable>
```

Note: *It is recommended that the initscript be prepended with 'AT' and include 'E1 V1 x4 Q0' so that the SLC console manager may properly control the modem.*

The following list includes options which accept the `CLEAR` command:

Note: `CLEAR` *must be in all caps.*

`set usb modem`	`dialinlist, chaphost, chapsecret, dodchaphost, dodchapsecret, initscript, dialoutlogin, dialoutpassword, dialbacknumber, group`

Description

Configures a currently loaded USB modem.

```
set usb storage dir
```

Syntax

```
set usb storage dir <U1>
```

Description

Displays a directory listing of a thumb drive.

```
set usb storage rename
```

Syntax

```
set usb storage rename <U1> file <Filename> newfile <New Filename>
```

Description

Renames a file on a thumb drive.

```
set usb storage copy
```

Syntax

```
set usb storage copy <U1> file <Filename> newfile <New Filename>
```

Description

Copies a file on a thumb drive.

```
set usb storage delete
```

Syntax

```
set usb storage delete <U1> file <Current Filename>
```

Description

Removes a file on a thumb drive.

```
set usb storage format
```

Syntax

```
set usb storage format <U1> [filesystem <ext2|fat16|fat32>]
```

Description

Formats a thumb drive. Runs a filesystem check on a thumb drive (recommended if it does not mount):

```
set usb storage fsck <U1>
```

```
set usb storage mount
```

Syntax

set usb storage mount <U1>

Description

Mounts a thumb drive for use as a storage device. The thumb drive can be used for saving configurations and device logging.

```
set usb storage unmount
```

Syntax

```
set usb storage unmount <U1>
```

Description

Unmounts a thumb drive.

```
show usb
```

Syntax

```
show usb
```

Description

Displays currently attached USB devices with their product information and settings.

```
show usb storage
```

Syntax

```
show usb storage
```

Description

Display product information and settings for any USB thumb drive.

```
show usb modem
```

Syntax

```
show usb modem
```

Description

Display product information and settings for any USB modem.

```
show user
```

Description

Displays information about the currently logged in user, including a list of groups retrieved from a remote authentication server and the actual group the user has inherited rights and attributes from. The `viewremoteperm` option also displays user attributes retrieved from a LDAP or RADIUS server.

```
show user [viewremoteperm <enable|disable>]
```

User Permissions Commands

Each user is a member of a group (default users, power users, administrators) and has a set of user rights associated with the group. Additional user rights which are not defined by the group may also be granted to them using the 'permissions' parameter.

The <Permission List> parameters is a comma-separated list of user rights to be added to or removed from current permissions. Precede the two-letter acronym with a '-' to remove a user right. For example, “nt,dt,-wb” adds Networking and Date/Time rights and removes Web Access rights.

The following parameters assign user rights:

nt - configure Networking

sv - configure Services

dt - configure Date/Time

lu - configure Local Users

ra - configure Remote Authentication methods

rs - Reboot or Shutdown the SLC

fc - manage Firmware and Configurations

ad - full Administrative rights

po - configure Power Outlets

dp - configure Device Ports

do - Device Port operations

pc - configure PC Cards

um - configure User Menus

dr - view Diagnostics & Reports

wb - Web Access

sn - configure Secure Lantronix Network

sk - configure SSH Keys

ub - configure USB

Note: *For remote authentication methods, there is one group and set of user rights defined for all users who login via a remote authentication method.*

VPN Commands

Configure an IPsec VPN tunnel:

```
set vpn <parameters>
```

Parameters

```
tunnel <enable|disable>
name <VPN Tunnel Name>
ethport <1|2>
auth <rsa|psk>
remotehost <Remote Host IP Address or Name>
remoteid <Authentication Name>
remotehop <IP Address>
remotesubnet <one or more subnets in CIDR notation>
localid <Authentication Name>
localhop <IP Address>
localsubnet <one or more subnets in CIDR notation>
```

```
ikenegotiation <main|aggressive>
ikeenc <any|3des|aes>
ikeauth <any|sha1|md5>
ikedhgroup <any|dh2|dh5>
espenc <any|3des|aes>
espauth <any|sha1|md5>
espdhgroup <any|dh2|dh5>
pfs <enable|disable>
modeconfig <enable|disable>
xauthclient <enable|disable>
xauthlogin <User Login>
```

The following list includes options which accept the CLEAR command:

`CLEAR` must be in all caps.

`set vpn`	`name, remoteid, localid, remotesubnet, localsubnet, xauthlogin`

Enter RSA public key or Pre-Shared Key of remote host:

```
set vpn key
```

Enter `XAUTH` password:

```
set vpn xauthpassword
```

Display all VPN settings and current status:

```
show vpn [email <Email Address>]
```

Display detailed VPN status:

```
show vpn status [email <Email Address>]
```

Display VPN logs:

```
show vpn viewlog [numlines <Number of Lines] [email <Email Address>]
```

Display RSA public key of the SLC:

```
show vpn rsakey
```

Appendix A: Bootloader

The SLC console manager provides a bootload command interface. This interface is only accessible through the SLC console port.

Accessing the Bootloader

To access the bootloader CLI:

1. Power up the SLC console manager.
2. Type **x15** within 10 seconds of power up. The bootloader halts the boot procedure and displays a **Lantronix** command prompt.

Bootloader Commands

Table A-1 User Commands

`help`	Lists and prints the command list and online help.
`?`	An alias for help.
`boot`	Boot default (runs bootcmd).
`bootcheck`	Checks boot bank information.
`bootinfo`	Displays boot bank information.
`bootsel 1|2`	Selects boot bank 1 or boot bank 2.
`IDE`	Accesses the IDE sub-system.
`mtest`	Performs a simple test of the RAM.
`showconf`	Displays hardware configuration.
`su cust|admin`	Switches to another user: from cust (customer) to admin (administrator) and vice versa.
`version`	Prints the bootloader version.
`whoami`	Displays information about the current user.

Administrator Commands

In addition to the commands that the user can issue, the administrator can issue the following commands:

`imagecopy`	Copies an image of the drive from the USB port or from the lower PCMCIA device to the internal CF card.
`passwd`	Provides a new password for user admin. The default password for user admin is admin. User cust does not have a password.
`ping`	Sends a ping request to the network host.
`printenv`	Prints bootloader variables.
`setenv`	Sets environment variables.
`showconf`	Displays hardware configuration parameters.

Appendix B: Security Considerations

The SLC console manager provides data path security by means of SSH or Web/SSL. Do not assume that you have complete security, however. Securing the data path is only one way to ensure security. This appendix briefly discusses some important security considerations.

Security Practice

Develop and document a Security Practice. For example, the Security Practice document should state the rules to maintaining security. For example, do not leave sessions open or advertise passwords because these actions could compromise SSH and SSL. Or, do not speculate about the facility and network infrastructure with reference to how vulnerable the CAT 5 wiring is to tapping.

Factors Affecting Security

External factors affect the security provided by the SLC device, for example:

- Telnet sends the login exchange as clear text across Ethernet. A person snooping on a subnet may read your password.
- A terminal to the SLC console manager may be secure, but the path from the SLC device to the end device may not be secure.
- With the right tools, a person having physical access to open the SLC console manager may be able to read the encryption keys.
- There is no true test for a denial-of-service attack; there is always a legitimate reason to request a storm. A denial-of-service filter locks out some high-performance automated/ scripted requests. The SLC device always attempts to service requests and does not filter out potential denial–of-service attacks.

Appendix C: Safety Information

This appendix describes the safety precautions that should be followed when installing and operating the SLC console manager. It contains the following sections:

- *Cover*
- *Power Plug*
- *Input Supply*
- *Grounding*
- *Fuses*
- *Rack*
- *Port Connections*

Cover

Do not remove the cover of the chassis. There are no user-serviceable parts inside. Opening or removing the cover may expose you to dangerous voltage that could cause fire or electric shock.

Note: *Refer all servicing to Lantronix, Inc.*

Power Plug

- When disconnecting the power cable from the socket, pull on the plug, not the cord.
- Always connect the power cord to a properly wired and grounded power source. Do not use adapter plugs or remove the grounding prong from the cord.
- Only use a power cord with a voltage and current rating greater than the voltage and current rating marked on the unit.
- Install the unit near an AC outlet that is easily accessible.
- Always connect any equipment used with the product to properly wired and grounded power sources.
- To help protect the product from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Do not connect or disconnect this product during an electrical storm.

Input Supply

- This unit may have more than one power supply source. Disconnect all power supply sources before servicing to avoid electric shock.
- Check nameplate ratings to assure there is no overloading of supply circuits that could affect over current protection and supply wiring.

Grounding

- Maintain reliable grounding of this product.
- Pay particular attention to supply connections when connecting to power strips, rather than directly to the branch circuit.
- Install DC-rated equipment only under the following conditions:
  - Connect the equipment to a DC supply source that is electrically isolated from the AC source and reliably connected to ground, or connect it to a DC (SELV) source.
  - Install only in restricted access areas (dedicated equipment rooms, equipment closets or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.
  - Route and secure input wiring to terminal block in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.
  - Incorporate a readily accessible disconnect device, with a 3 mm minimum contact gap, in the fixed wiring.
  - Provide a listed circuit breaker suitable for protection of the branch circuit wiring and rated 60 VDC minimum.

Fuses

For protection against fire, replace the power-input-module fuse with the same type and rating.

Rack

If rack mounted units are installed in a closed or multi-unit rack assembly, they may require further evaluation by Certification Agencies. The following items must be considered:

- Do **not** install the unit in a rack in such a way that a hazardous stability condition results because of uneven loading. A drop or fall could cause injury.
- The ambient temperature (Tma) inside the rack may be greater than the room ambient temperature. Make sure to install the SLC console manager in an environment with an ambient temperature less than the maximum operating temperature of the SLC device. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Install the equipment in a rack in such a way that the amount of airflow required for safe operation of the equipment is not compromised.
- Maintain reliable earthing of rack-mounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips) because of the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Before operating the SLC console manager, make sure the SLC unit is secured to the rack.

Port Connections

- Only connect the network port to an Ethernet network that supports 10Base-T/100Base-T.
- Only connect device ports to equipment with serial ports that support EIA-232 (formerly RS-232C).
- Only connect the console port to equipment with serial ports that support EIA-232 (formerly RS-232C).

Appendix D: Sicherheitshinweise

Dieser Anhang beschreibt die Sicherheitshinweise die bei der Installation und Benutzung des SLC Gerätes befolgt werden müssen. Es beinhaltet die folgenden Punkte:

- *Geräteabdeckung*
- *Netzstecker*
- *Stromversorgung*
- *Anschluß an die Schutzerde*
- *Gerätesicherung*
- *Rack / Einbauschrank*
- *Signalverbindungen*

Geräteabdeckung

Entfernen Sie nicht die Abdeckung des Gerätes. Es gibt keine zu wartenden Teile innerhalb des Gerätes. Beim öffnen oder entfernen der Abdeckung könnten Sie gefährlichen Spannungen ausgesetzt werden die unter Umständen Feuer oder elektrischen Schlag zur Folge haben könnten.

Hinweis: *Lassen Sie alle Wartungsarbeiten durch die Firma Lantronix durchführen.*

Netzstecker

- Wenn Sie das Netzkabel von der Steckdose trennen, ziehen Sie am Stecker und nicht am Kabel
- Das Netzkabel muß unter allen Umständen an einer geeigneten sowie geerdeten Netzversorgung angeschlossen werden. Benutzen Sie keine Adapterstecker und entfernen Sie nicht den Schutzleiteranschluss des Netzkabels.
- Benutzen Sie nur ein Netzkabel, das mindestens mit den Anforderungen bezüglich der Spannungs und Stromangaben des Gerätes entsprechen.
- Installieren Sie das Gerät nur an einer leicht zugänglichen Stromversorgung.
- Schließen Sie nur Geräte an das Produkt an, die ensprechend verdrahtet und an einer geerdeten Stromversorgung angeschlossen sind.
- Um das Gerät vor plötzlichen Überspannungsspitzen und Spannungsabfall zu schützen, benutzen Sie entweder einen Überspannungsableiter, Netzleitungsstabilisierer oder eine Unterbrechungsfreie Stromversorgung (UPS).
- Während eines Gewitters sollte das Gerät nicht von der Netzversorgung getrennt oder daran angeschlossen werden.

Stromversorgung

- Dieses Gerät kann mehr als eine Stromversorgung haben. Trennen Sie alle Stromquellen vor Wartungsarbeiten, um elektrischen Schlag zu vermeiden.
- Überprüfen Sie die elektrischen Angaben auf dem Typenschild um sicherzustellen, das die Netzversorgung oder Anschlußkabel nicht überlastet werden.

Anschluß an die Schutzerde

- Stellen Sie sicher, daß das Gerät immer ausreichend mit der Schutzerde verbunden ist.
- Beachten Sie dieses besonders im Falle des Anschlusses an ein Verlängerungskabel oder wenn aus einem anderen Grund das Gerät nicht direkt an eine Steckdose angeschlossen wird.
- Schließen Sie ein ausschließlich für Gleichstrom geeignetes Gerät nur unter folgenden Bedingungen an:
    - Schließen Sie das Gerät nur an eine Gleichstromversorgung an, die elektrisch von einer Wechselstromversorgung getrennt ist und ausreichend geerdet ist, oder verbinden Sie das Gerät mit einer Gleichstromversorgung des Typen SELV
    - Installieren Sie das Gerät nur an einem Ort / Betriebsstätte mit beschränktem Zutritt (speziel dafür vorgesehene IT Räume, Schaltschränke oder ähnliches)
    - Führen und sichern Sie die Anschlussverdrahtung so zu den Anschlussklemmen daß sie vor hoher Beanspruchung und Beschädigung geschützt ist.
    - Beim Anschluß des Gerätes muß eine leicht zugängliche Trennvorrichtung mit einem Kontaktabstand, der mindestens 3mm beträgt, in die Anschlußverkabelung mitinstalliert werden
    - Für die Absicherung des Anschlußstromkreises muß ein geeigneter Schutzschalter benutzt werden, der mindestens für eine Gleichspannung von 60V bemessen ist.

Gerätesicherung

Für den Schutz gegen Feuer ersetzen Sie die Sicherung des Eingangsmodules nur mit einer Sicherung gleichen Typs und Nenngröße.

Rack / Einbauschrank

Falls Geräte für die Installierung in einen Geräteschrank in einen solchen Schrank eingebaut werden, der entweder geschlossen ist oder in dem sich andere Geräte befinden, muß unter Umständen eine weitere Abnahme durch eine Zertifizierungsstelle veranlasst werden. Die folgenden Punkte müssen dabei beachtet werden:

- Installieren Sie das Gerät nicht in einen Einbauschrank oder Rack so daß es zu einer gefährlichen, ungleichgewichtigen Anordnung kommen kann. Das heraus-, hin- oder umfallen kann zu Verletzungen führen.
- Die Umgebungstemperatur (Tma) innerhalb des Einbauschrankes oder Racks kann höher sein als die Raumtemperatur. Stellen Sie sicher, daß das SLC Gerät in einer Umgebung

installiert wird, in der die Temperatur geringer als die für das SLC Gerät angegebene, maximale Betriebstemperatur ist.

- Installieren Sie das Gerät in einen Einbauschrank oder Rack so daß es zu keiner Einschränkung der Luftzufuhr kommt, die einen sicheren Betrieb des Gerätes gewährleistet.
- Installieren Sie das Gerät in einen Einbauschrank oder Rack so daß es zu keiner ungleichen, mechanischen Belastung kommt, die zu einer gefährlichen Situation führen kann. Stellen Sie sicher, daß Geräte, die für den Einbau in einen Geräteschrank oder Rack vorgesehen sind, ausreichend mit der Schutzerde verbunden sind. Beachten Sie dieses besonders im Falle des Anschlusses an eine Steckdosenleiste oder wenn aus einem anderen Grund das Gerät nicht direkt an eine Steckdose angeschlossen wird.
- Bevor Sie das SLC Gerät in Betrieb nehmen stellen Sie sicher, daß es entsprechend und sicher in den Einbauschrank oder Rack installiert ist.

Signalverbindungen

- Verbinden Sie den Netzwerkanschluß nur an einen Ethernetanschluß, der den Typen 10Base-T/100Base-T unterstützt.
- Verbinden Sie die Signalanschlüsse des Gerätes nur an Serielle Anschlüsse, die das Format EIA-232 (früher RS-232C) unterstützten.
- Verbinden Sie die Anschlüsse der Gerätekonsole nur an Serielle Anschlüsse, die das Format EIA-232 (früher RS-232C) unterstützten.

Achtung: ***Dieses Gerät kann mehr als eine Stromversorgung haben. Trennen Sie alle Stromquellen vor Wartungsarbeiten, um elektrischen Schlag zu vermeiden.***

Appendix E: Adapters and Pinouts

The serial device ports of the SLC products match the RJ45 pinouts of the console ports of many popular devices found in a network environment. The SLC console manager uses conventional straight-through Category 5 fully pinned network cables for all connections when used with Lantronix adapters. The cables are available in various lengths.

In most cases, you will need an adapter for your serial devices. Lantronix offers a variety of RJ45-to-serial connector adapters for many devices. These adapters convert the RJ45 connection on the SLC console manager to a 9-pin or 25-pin serial connector found on other manufacturers' serial devices or re-route the serial signals for connections to other devices that use RJ45 serial connectors.

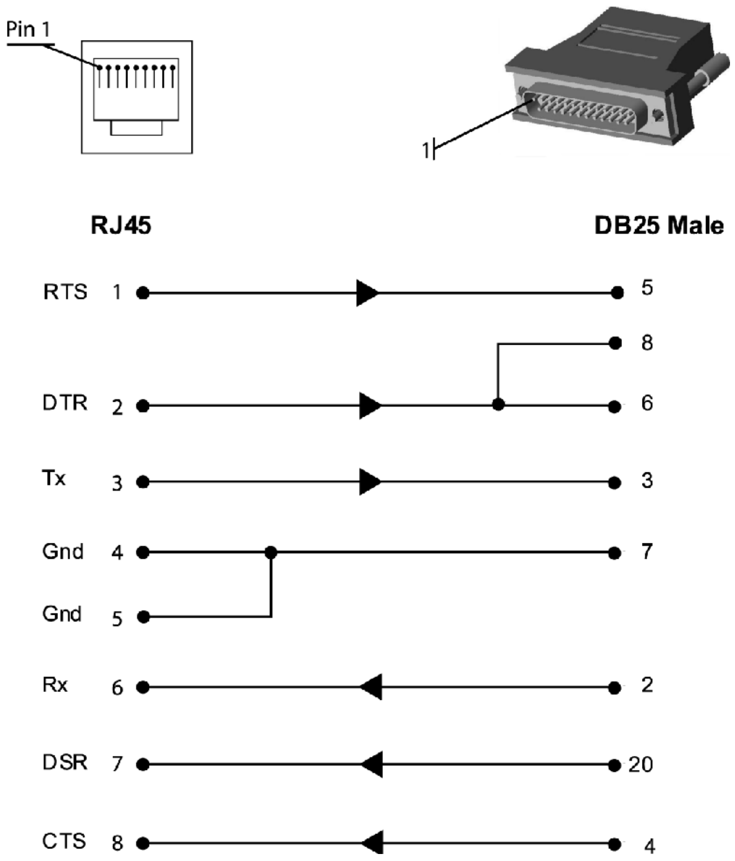
Please check the cabling database on the Lantronix web site at http://www.lantronix.com for suggested cables and adapters for commonly used serial devices.

The console port is wired the same way as the device ports and has the same signal options.

Note: *You can view or change the console port settings using the LCDs and pushbuttons on the front panel, the Console Port web page, or the command line interface* `show console port` *and* `set consoleport` *commands.*

The adapters shown in this chapter are compatible with the Lantronix SLC models.

Figure E-1 RJ45 Receptacle to DB25M DCE Adapter for the SLC Console Manager (PN 200.2066A)



Use PN 200.2066A adapter with a dumb terminal or with many SUN applications.

Figure E-2 RJ45 Receptacle to DB25F DCE Adapter for the SLC Console Manager (PN 200.2067A)

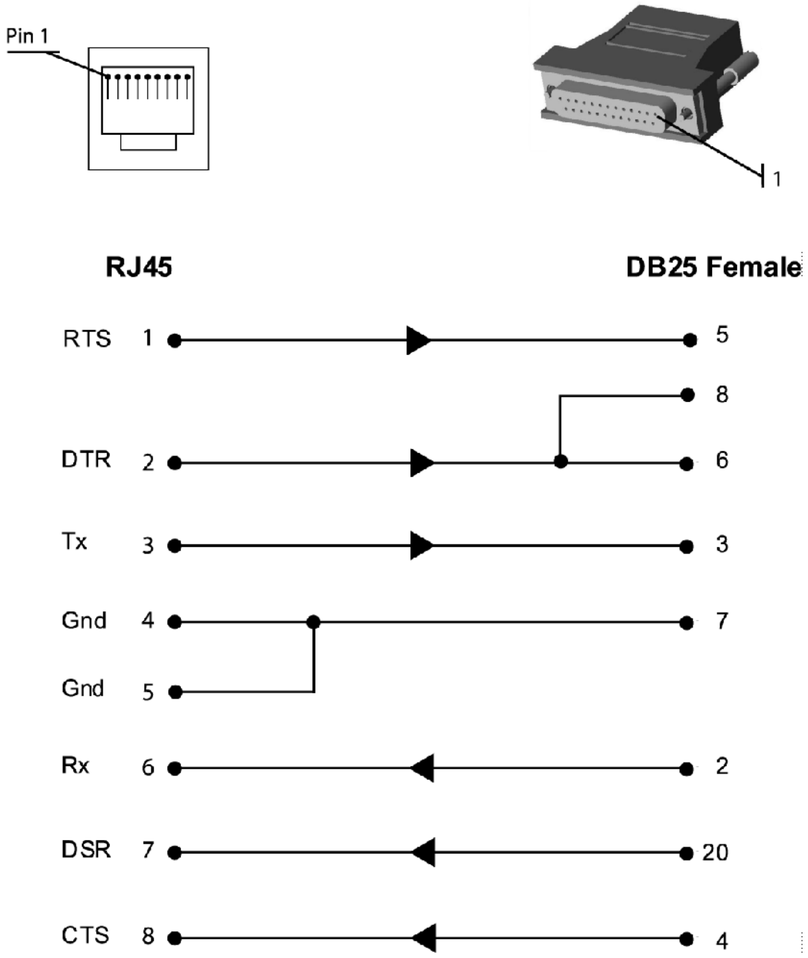


Figure E-3 RJ45 Receptacle to DB9M DCE Adapter for the SLC Console Manager (PN 200.2069A)

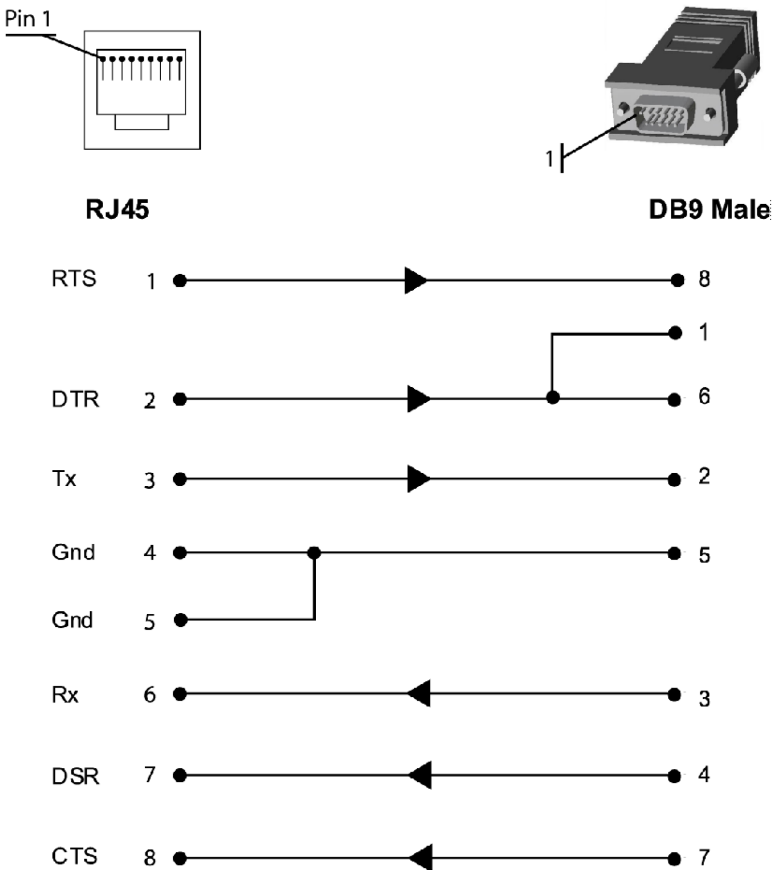
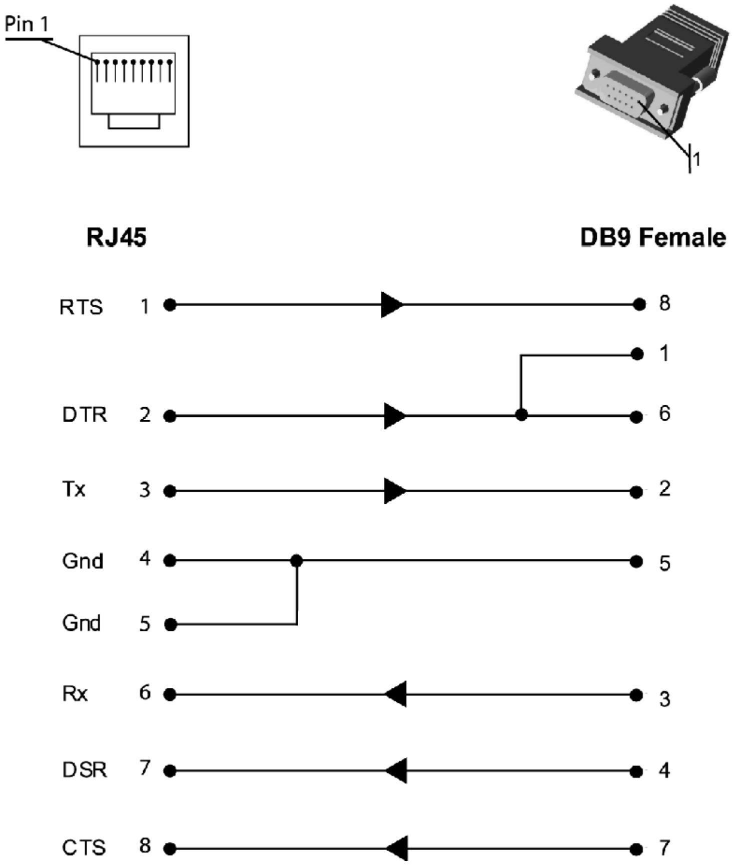
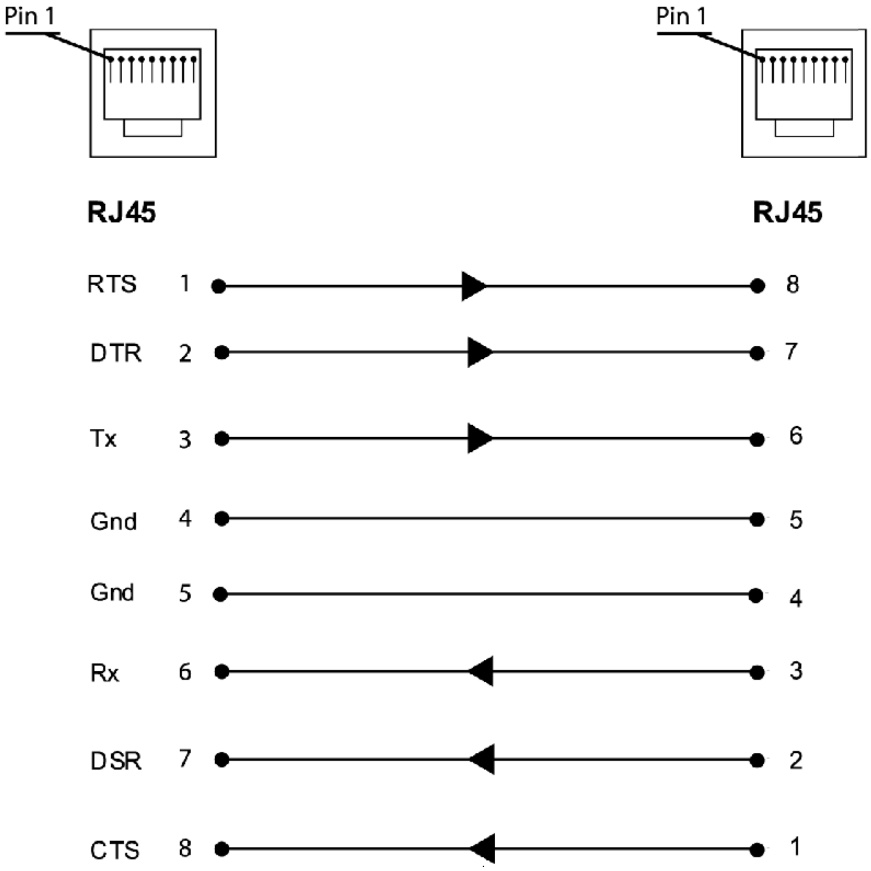


Figure E-4 RJ45 Receptacle to DB9F DCE Adapter for the SLC Console Manager (PN 200.2070A)



Use PN 200.2070A adapter with a PC serial port.

Figure E-5 RJ45 to RJ45 Adapter for Netra/Sun/Cisco and SLP (PNs 200.2225 and ADP010104-01)



Note: *The cable ends of the ADP010104-01 are an RJ45 socket on one end and a RJ45 plug on the other instead of RJ45 sockets on both ends.*

Use this adapter for SLP remote power manager, Netra/SUN/Cisco, and others.

Appendix F: Protocol Glossary

BOOTP (Bootstrap Protocol)

Similar to DHCP, but for smaller networks. Automatically assigns the IP address for a specific duration of time.

CHAP (Challenge Handshake Authentication Protocol)

A secure protocol for connecting to a system; it is more secure than the PAP.

DHCP (Dynamic Host Configuration Protocol)

Internet protocol for automating the configuration of computers that use TCP/IP.

DNS (Domain Name Servers)

A system that allows a network name server to translate text host names into numeric IP addresses.

IPsec (Internet Protocol Security)

A protocol suite for securing Internet Protocol (IP) communications by authenticating and encrypting each IP packet of a communication session. IPsec includes protocols for establishing mutual authentication between agents at the beginning of the session and negotiation of cryptographic keys to be used during the session. IPsec can be used in protecting data flows between a pair of hosts (host-to-host), between a pair of security gateways (network-to-network), or between a security gateway and a host (network-to-host).

Kerberos

A network authentication protocol that provides strong authentication for client/server applications by using secret-key cryptography.

LDAP (Lightweight Directory Access Protocol)

A protocol for accessing directory information.

Modem State Parameters

Dial-in—The SLC console manager waits for a peer to call the SLC unit to establish a text (command line) or PPP connection.

- For text connections, the user will be prompted for a login and password, and will be authenticated via the currently the currently enabled authentication methods (Local Users, NIS, LDAP, etc). Once authenticated, a CLI session will be initiated, and the user will remain connected to the SLC console manager until they either logout of the CLI session, or (if **Timeout Logins** is enabled) the CLI session is terminated if it has been idle.
- For PPP connections, the user will be authenticated via PAP or CHAP (configured with the **Authentication** setting). For PAP, the Local User list will be used to authenticate the login and password sent by the PPP peer. For CHAP, the **CHAP Handshake Host/User Name** and **Secret/User Password** will be used to authenticate the login and password sent by the PPP peer. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

  Dial-out—The SLC console manager dials a remote peer to establish a PPP connection. The SLC device dials the **Dial-out Number**, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

Dial-back—The SLC console manager waits for a peer to call the SLC device, establishes a text (command line) or PPP connection, authenticates the user, and if the SLC console manager is able to determine a dial-back number to use, hangs up and calls the dial-back number to establish either a text or PPP connection.

- For text connections, the user will be prompted for a login and password, and will be authenticated via the currently the currently enabled authentication methods (Local Users, NIS, LDAP, etc). Once authenticated, the SLC device will use the **Dial-back Number** configured for the modem – either a fixed number assigned to the modem, or a number associated with the user that was authenticated (the user must have **Allow Dial-back** enabled and a **Dial-back Number** defined). If the SLC console manager can determine a dial-back number to use, it will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC device will dial, prompt the user again for a login and password, and a CLI session will be initiated. The user will remain connected to the SLC console manager until they either logout of the CLI session, or (if **Timeout Logins** is enabled) the CLI session is terminated if it has been idle.
- For PPP connections, the user will be authenticated via PAP or CHAP (configured with the **Authentication** setting). For PAP, the Local User list will be used to authenticate the login and password sent by the PPP peer. For CHAP, the **CHAP Handshake Host/User Name** and **Secret/User Password** will be used to authenticate the login and password sent by the PPP peer. Once authenticated, the SLC device will use the **Dial-back Number** configured for the modem – either a fixed number assigned to the modem, or a number associated with the user that was authenticated (the user must have **Allow Dial-back** enabled and a **Dial-back Number** defined). If the SLC console manager can determine a dial-back number to use, it will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC device will dial, and if the remote peer requests PAP or CHAP authentication, provide the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

  Dial-on-demand—The SLC console manager automatically dial outs and establishes a PPP connection when IP traffic destined for the peer needs to be sent. It will remain connected until no data packets have been sent to the peer for a specified amount of time. The modem cannot be configured for **Negotiate IP Address –** it must be configured with a **Local IP** and a **Remote IP** as the PPP connection will be established when it sees IP traffic destined for the **Remote IP**. When this occurs, the SLC device dials the **Dial-out Number**, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using the **Local IP** and the **Remote IP**. The PPP connection will stay active until no IP traffic for the **Remote IP** is sent for **Modem Timeout** seconds. Once the timeout has expired, the PPP connection will be terminated and will not be reestablished for at least **Restart Delay** seconds.

  Dial-in and Dial-on-demand—A modem is configured to be in two modes: answering incoming calls to establish a PPP connection, and automatically dialing out to establish a PPP connection when IP traffic destined for the peer needs to be sent. When either event occurs (an incoming call or IP traffic destined for the peer), the other mode will be disabled. The modem cannot be configured for **Negotiate IP Address –** it must be configured with a **Local IP** and a **Remote IP** as the PPP connection will be established when it sees IP traffic destined for the **Remote IP**.
- For Dial-in, the user will be authenticated via PAP or CHAP (configured with the **Authentication** setting). For PAP, the Local User list will be used to authenticate the login and password sent by the PPP peer. For CHAP, the **CHAP Handshake Host/User Name** and **Secret/User Password** will be used to authenticate the login and password sent by the PPP

peer. Once authenticated, a PPP session will be established using the **Local IP** and the **Remote IP**.

- For Dial-on-Demand, the PPP connection will be established when it sees IP traffic destined for the **Remote IP**. When this occurs, the SLC console manager dials the **Dial-out Number**, and if the remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using the **Local IP** and the **Remote IP**. The PPP connection will stay active until no IP traffic for the **Remote IP** is sent for **Modem Timeout** seconds. Once the timeout has expired, the PPP connection will be terminated and will not be reestablished for at least **Restart Delay** seconds.

Dial-in/Host List—The SLC device waits for a peer to call and establishes a text (command line) connection to the first host in a Host List that connects. A host list of a prioritized list of SSH, Telnet or raw TCP hosts to connect to. If **Authentication** is enabled for the Host List, the user will be prompted for a login and password, and will be authenticated via the currently enabled authentication methods (Local Users, NIS, LDAP, etc). Once authenticated, the SLC console manager will try to connect to each host in the host list until a successful connection is established.

Callback Control Protocol (CBCP) Server and CBCP Client—CBCP is a PPP option that negotiates the use of callback where the server, after authenticating the client, terminates the connection and calls the client back at a phone number that is determined by the CBCP handshake. For more information on CBCP, see http://technet.microsoft.com/en-us/library/cc957979.aspx. CBCP is used primarily by Microsoft PPP peers. CBCP supports two options for determining the number to dial on callback: the client can specify a user-defined number for the server to dial on callback, or the client can request the server use an administrator-defined number to dial on callback. Optionally, some servers may also allow “no callback” as an option.

- **CBCP Server**—The SLC device waits for a client to call the SLC console manager, establishes a PPP connection, authenticates the user, and negotiates a dial-back number with the client using CBCP.   If the SLC device is able to determine a dial-back number to use, it hangs up and calls the dial-back number.
- When a call is received, a PPP connection is established, and the user will be authenticated via PAP or CHAP (configured with the **Authentication** setting). For PAP, the Local User list will be used to authenticate the login and password sent by the PPP peer. For CHAP, the **CHAP Handshake Host/User Name** and **Secret/User Password** will be used to authenticate the login and password sent by the PPP peer. Once authenticated, the CBCP handshake with the client determines the number to use for dial-back. The SLC console manager will present the client with the available options: if the authenticated user is a Local User with **Allow Dial-back** enabled and a **Dial-back Number** defined, the administrator-defined option is allowed; if this is not the case, the user-defined number is allowed.
- Additionally, if **CBCP Server Allow No Callback** is enabled, the client can also select no callback (the PPP connection established at dial-in will remain up). The client will select from the available callback options.   If the SLC device can determine a dial-back number to use, it will hang up and wait **Dial-back Delay** seconds before initiating the dial-back. The SLC console manager will dial, and if the remote peer requests PAP or CHAP authentication, provide the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).
- **CBCP Client**—The SLC device will dial out to a CBCP server, establish a PPP connection, negotiate a callback number with the server using CBCP, terminate the connection, and wait for the server to call back. The SLC console manager dials the **Dial-out Number**, and if the

remote peer requests PAP or CHAP authentication, provides the **Dial-out Login** and **Dial-out Password** as authentication tokens. Once authenticated, the CBCP handshake with the server determines the number to use for dial-back.

- The SLC device will request the type of number defined by **CBCP Client Type** - either an Admin-defined Number (the CBCP server determines the number to call) or a User-defined Number (the SLC console manager will provide the **Fixed Dial-back Number** as the number to call). If the CBCP handshake is successful, the SLC device will terminate the PPP connection, hang up, and wait for the server to dial back. When the server dials and the PPP connection is established, the user will be authenticated via PAP or CHAP (configured with the **Authentication** setting).
- For PAP, the Local User list will be used to authenticate the login and password sent by the PPP peer.
- For CHAP, the **CHAP Handshake Host/User Name** and **Secret/User Password** will be used to authenticate the login and password sent by the PPP peer. Once authenticated, a PPP session will be established using either negotiated IP addresses or specific IP addresses (determined by the **Negotiate IP Address** setting).

Notes:

- In a state where the modem will be answering a call, the modem should always be configured for manual answer, not auto answer.
- When answering a call, the SLC console manager answers after the 2nd ring.
- Any text or PPP connection can be terminated by setting the modem state to disabled.

NAT (Network Address Translation)

An Internet standard that enables a LAN to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. This enables a company to shield internal addresses from the public Internet.

NFS (Network File System)

A protocol that allows file sharing across a network. Users can view, store, and update files on a remote computer. You can use NFS to mount all or a portion of a file system. Users can access the portion mounted with the same privileges as the user's access to each file.

NIS (Network Information System)

System developed by Sun Microsystems for distributing system data such as user and host names among computers on a network.

NMS (Network Management System)

NMS acts as a central server, requesting and receiving SNMP-type information from any computer using SNMP.

NTP (Network Time Protocol)

A protocol used to synchronize time on networked computers and equipment.

PAP (Password Authentication Protocol)

A method of user authentication in which the username and password are transmitted over a network and compared to a table of name-password pairs.

PPP (Point-to-Point Protocol)

A protocol for creating and running IP and other network protocols over a serial link.

RADIUS (Remote Authentication Dial-In User Service)

An authentication and accounting protocol. Enables remote access servers to communicate with a central server to authenticate dial-in users and their access permissions. A company stores user profiles in a central database that all remote servers can share.

SMB/CIFS

(Server Message Block/Common Internet File System): Microsoft’s protocol for allowing all applications as well as Web browsers to share files across the Internet. CIFS runs on TCP/IP and uses the SMB protocol in Microsoft Windows for accessing files. With CIFS, users with different platforms and computers can share files without having to install new software.

SNMP (Simple Network Management Protocol)

A protocol that system administrators use to monitor networks and connected devices and to respond to queries from other network hosts.

SMTP (Simple Mail Transfer Protocol)

TCP/IP protocol for sending email between servers.

SSL (Secure Sockets Layer)

A protocol that provides authentication and encryption services between a web server and a web browser.

SSH (Secure Shell)

A secure transport protocol based on public-key cryptography.

TACACS+ (Terminal Access Controller Access Control System)

A method of authentication used in UNIX networks. It allows a remote access server to communicate with an authentication server to determine whether the user has access to the network.

Telnet

A terminal protocol that provides an easy-to-use method of creating terminal connections to a network host.

Appendix G: Compliance Information

The following information specifies compliance information in accordance with ISO/IEC Guide 22 and EN 45014).

Manufacturer Name and Address

Lantronix Inc., 167 Technology, Irvine, CA 92618 USA

Declares that the following product:

Product Names: Models SLC8, SLC16, SLC32, and SLC48 Console Managers

Conform to the following standards or other normative documents:

Safety: EN60950:1992+A1, A2, A3, A4, A11

Electromagnetic Emissions

EN55022: 1994 (IEC/CSPIR22: 1993)

FCC Part 15, Subpart B, Class B

IEC 1000-3-2/A14: 2000

IEC 1000-3-3: 1994

Electromagnetic Immunity

EN55024: 1998 Information Technology Equipment-Immunity Characteristics

IEC61000-4-2: 1995 Electro-Static Discharge Test

IEC61000-4-3: 1996 Radiated Immunity Field Test

IEC61000-4-4: 1995 Electrical Fast Transient Test

IEC61000-4-5: 1995 Power Supply Surge Test

IEC61000-4-6: 1996 Conducted Immunity Test

IEC61000-4-8: 1993 Magnetic Field Test

IEC61000-4-11: 1994 Voltage Dips & Interrupts Test

Supplementary Information

This Class A digital apparatus complies with Canadian ICES-003 (CSA) and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment. The product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

Additional Agency Approvals and Certifications

VCCI

TUV

GS Mark

UL/CUL

C-Tick

CB Scheme

NIST-certified implementation of AES as specified by FIPS 197

This product carries the CE mark since it has been tested and found compliant with the following standards:

Safety:EN 60950

Emissions:EN 55022 Class A

Immunity:EN 55024

RoHS Notice

All Lantronix products in are China RoHS-compliant and free of the following hazardous substances and elements:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr (VI))
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

Table G-1 Lantronix Product Family Names and Toxic/Hazardous Substances and Elements

Product Family Name	Toxic or hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
UDS1100 and 2100	0	0	0	0	0	0
EDS	0	0	0	0	0	0
MSS100	0	0	0	0	0	0
IntelliBox	0	0	0	0	0	0
XPress DR and XPress-DR+	0	0	0	0	0	0
SecureBox 1101 and 2101	0	0	0	0	0	0
WiBox	0	0	0	0	0	0
UBox	0	0	0	0	0	0
MatchPort	0	0	0	0	0	0
SLC	0	0	0	0	0	0
XPort	0	0	0	0	0	0
WiPort	0	0	0	0	0	0
SLB	0	0	0	0	0	0
SLP	0	0	0	0	0	0
SCS	0	0	0	0	0	0
SLS	0	0	0	0	0	0
DSC	0	0	0	0	0	0

0: Toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

x: Toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

Manufacturer Contact

Lantronix, Inc.

167 Technology, Irvine, CA 92618 USA

Phone: 949-453-3990

Fax: 949-453-3995

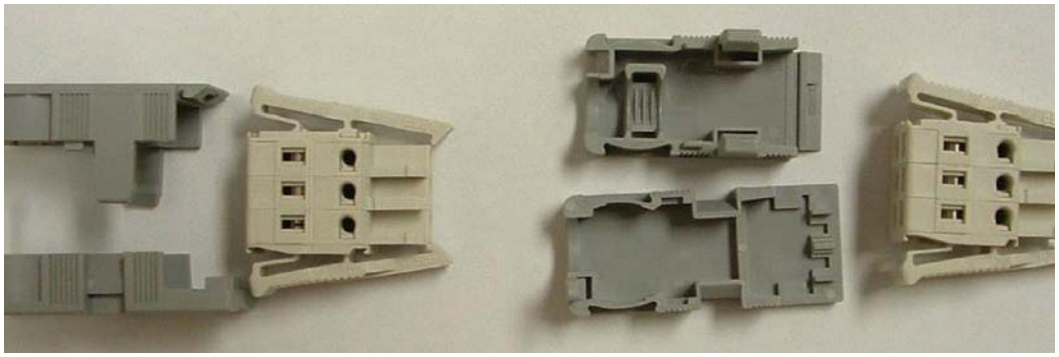
Appendix H: DC Connector Instructions

The -48VDC plug connector is provided to make the input power connectors for your console server. The -48VDC input source should be circuit breaker or fuse protected at 5 amps.

- Input Voltage: -48VDC (acceptable range of -40 to -60 VDC)
- Max. Operating Current: 1.5 amps
- Max. Input Surge Current: 5 amps
- Continuous Power: 100 watts required
- Electrically isolated from any source
- Connected to reliable Earth ground

The connector kit contains 6 pieces that make 2 complete -48VDC connectors as shown in *Figure H-1*.

Figure H-1 Connector Kit Contents

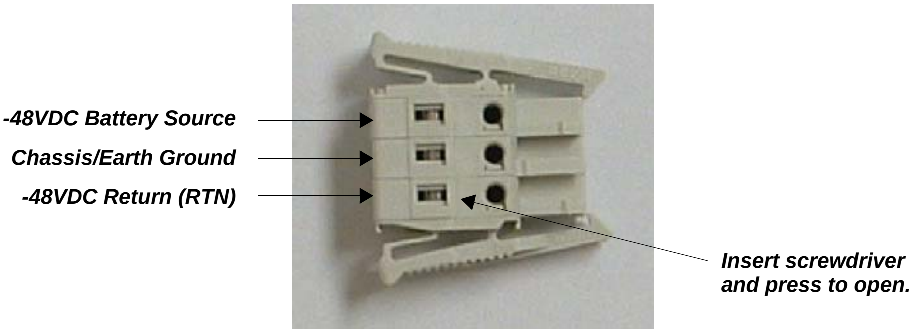


Caution: ***Ensure that the SLC power source is turned off while assembling the connector head.***

To assemble the DC plug connectors:

1. Use 16AWG copper wire to make the connections shown in *Figure H-2*.

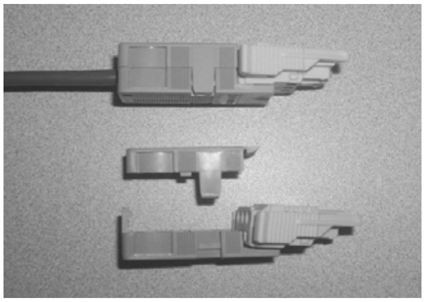
Figure H-2 Wire Connections



2. Strip a suitable amount of wire (~3/8”) from each lead to be inserted into each connector position.

3. Using a small screwdriver, press the slot to release the spring pressure for each conductor (as shown in *Figure H-2*) and insert the wire. When the wire is in position, release the pressure on the screwdriver to securely capture the wire.
4. After the leads are installed as shown in *Figure H-2*, assemble the strain relief (2 gray pieces) to the connector plug and snap the connector together as shown in *Figure H-3*.

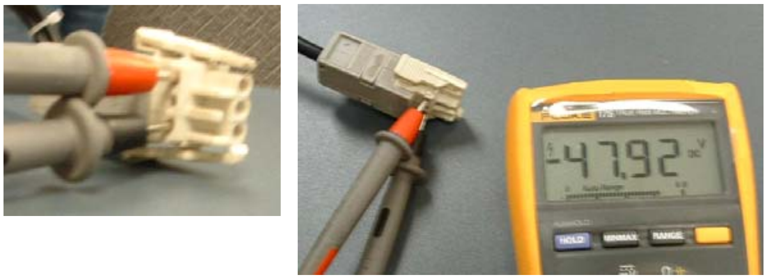
Figure H-3 Plug Parts to Assemble



Caution: ***Verify wiring before connecting to the SLC console manager. If the polarity is reversed, you can damage the SLC internal power supply.***

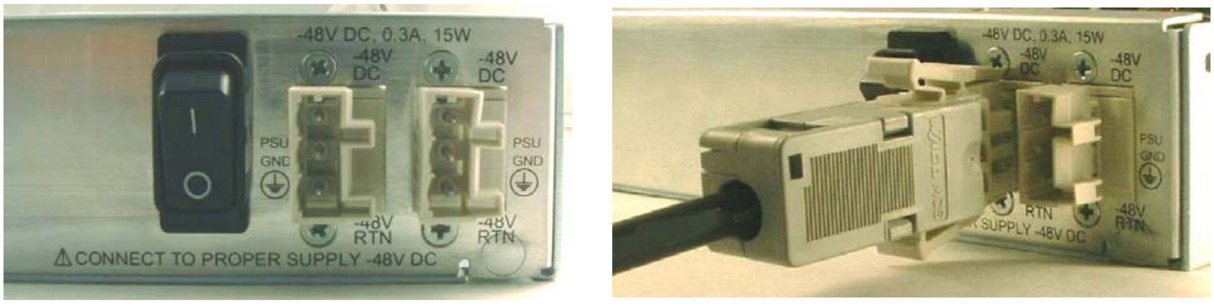
5. Connect a Digital Volt/OHM (DVOM) meter to the power source leads and verify the (-48 VDC) power source.
    a. Insert the **RED** (+) lead of the DVOM into the top hole of the connector for the source power lead.
    b. Then insert the **BLACK** (–) lead of the DVOM into the bottom hole of the connector for the return power lead as shown in *Figure H-4*.

Figure H-4 Verification of the Power Source



    c. Turn on your power source, the voltage should read (-48.00 VDC ±.5 VDC) as shown in the DVOM in *Figure H-4*.
6. With power source off and SLC power switch off, perform the following steps:
    a. Connect the DC power cords to your SLC console server as shown in *Figure H-5*.

Figure H-5 DC Power Cord into the SLC Console Manager



b. Turn on your -48VDC power source.

c. Turn on the power switch of the SLC console server.

7. Follow the setup instructions in your SLC manual to use your product.

Appendix I: LDAP Schemas

This appendix describes the procedure for defining individual user permissions from a Windows Active Directory (AD) server to use with the SLC console manager firmware version 5.4 or greater.

The procedure outlined in this appendix is based on Windows Server 2003 and 2008 and can vary with other Windows versions.

Note: *In this appendix, the terms "rights and permissions" are used interchangeably.*

This appendix contains the following sections:

- *Installing Schema Support in Window AD Server*
- *Creating the SLC Schema Attribute*
- *Adding the Attribute to the Users Group in Windows*
- *Adding the Permissions to the Individual User*
- *Values to Use*
- *String Format*

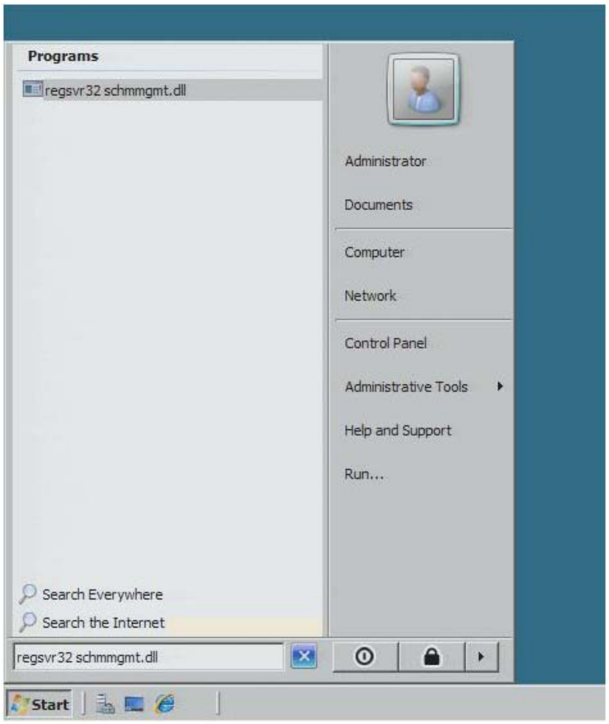
Installing Schema Support in Window AD Server

To install schema support in a Windows AD server for the SLC console manager, follow the steps contained in the document at http://technet.microsoft.com/en-us/library/cc731628.aspx.

Or perform the following steps that were copied from the website above.

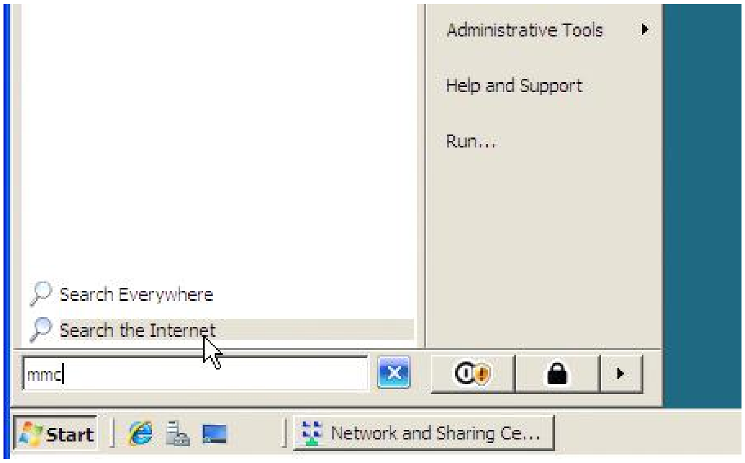
1. Open a command prompt and type `regsvr32 schmmgmt.dll`.
2. Press **Enter**. *Figure I-1* shows the window that displays.

Figure I-1 Programs Window



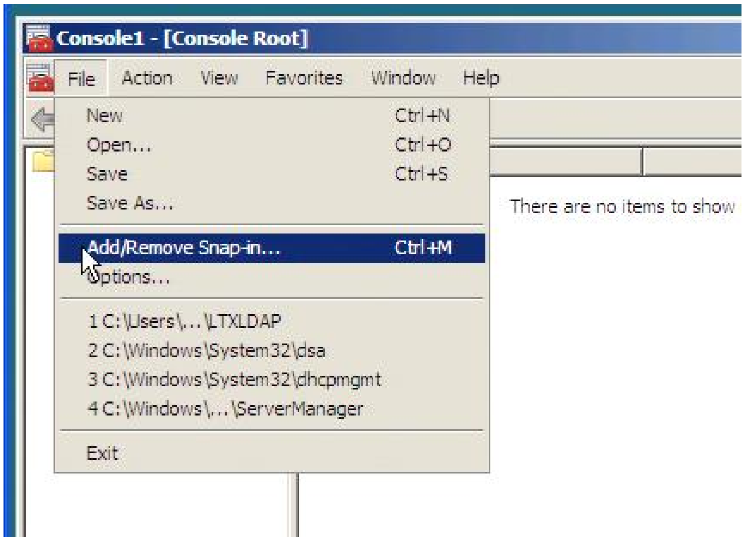
3. Click **Start > Run > mmc**.
4. Click **OK**. *Figure I-2* shows the window that displays.

Figure I-2 MMC Window



5. On the **File** menu, click **Add/Remove Snap-in**. *Figure I-3* shows the window that displays.

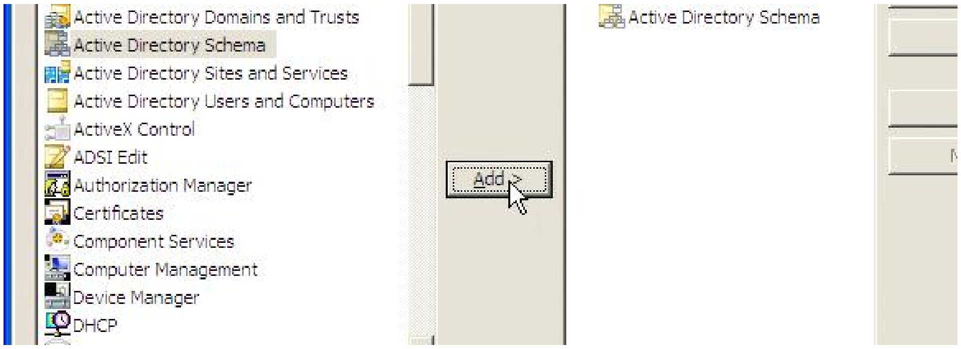
Figure I-3 Snap-In Window


Console1 - [Console Root]
File
Action
View
Favorites
Window
Help
New Ctrl+N
Open... Ctrl+O
Save Ctrl+S
Save As...
Add/Remove Snap-in... Ctrl+M
Options...
1 C:\Users\...\LTXLDAP
2 C:\Windows\System32\dsa
3 C:\Windows\System32\dhcpmgmt
4 C:\Windows\...\ServerManager
Exit

There are no items to show

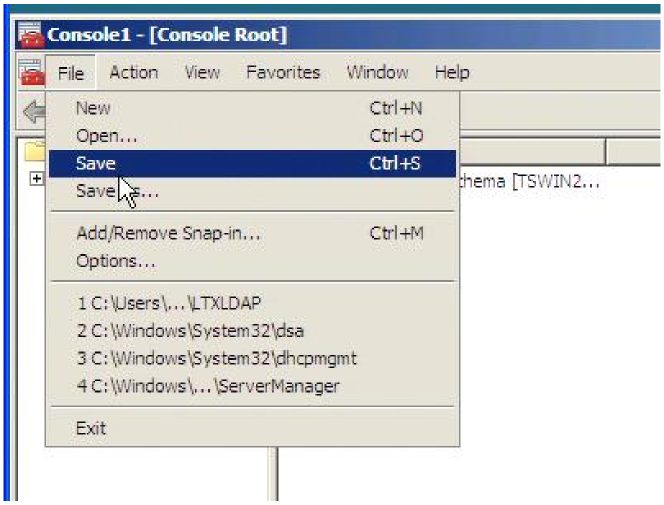
6. Under Available snap-ins, click **Active Directory Schema > Add > OK**. *Figure I-4* shows the directory that displays.

Figure I-4 Active Directory Schema



7. To save this console, click Save on the **File** menu. *Figure I-5* shows the window that displays.

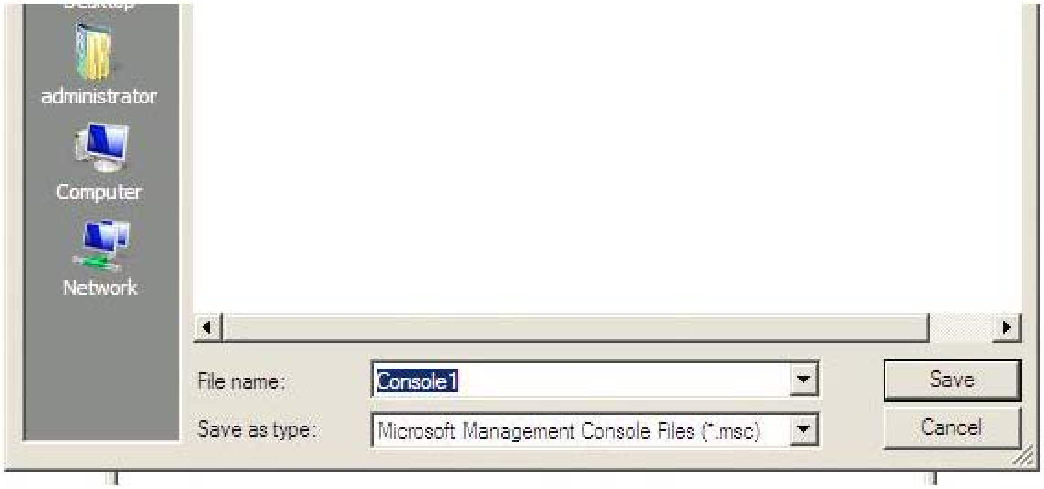
Figure I-5 Console Root


Console1 - [Console Root]
File
Action
View
Favorites
Window
Help
New Ctrl+N
Open... Ctrl+O
Save Ctrl+S
Save As...
Add/Remove Snap-in... Ctrl+M
Options...
1 C:\Users\...\LTXLDAP
2 C:\Windows\System32\dsa
3 C:\Windows\System32\dhcpmgmt
4 C:\Windows\...\ServerManager
Exit
hema [TSWIN2...

8. In the Save As dialog box, do one of the following:

   a. To place the snap-in in the Administrative Tools folder, in File name box, type a name for the snap-in, and then click **Save**. *Figure I-6* shows the folder that displays.

Figure I-6 Administrative Tools Folder

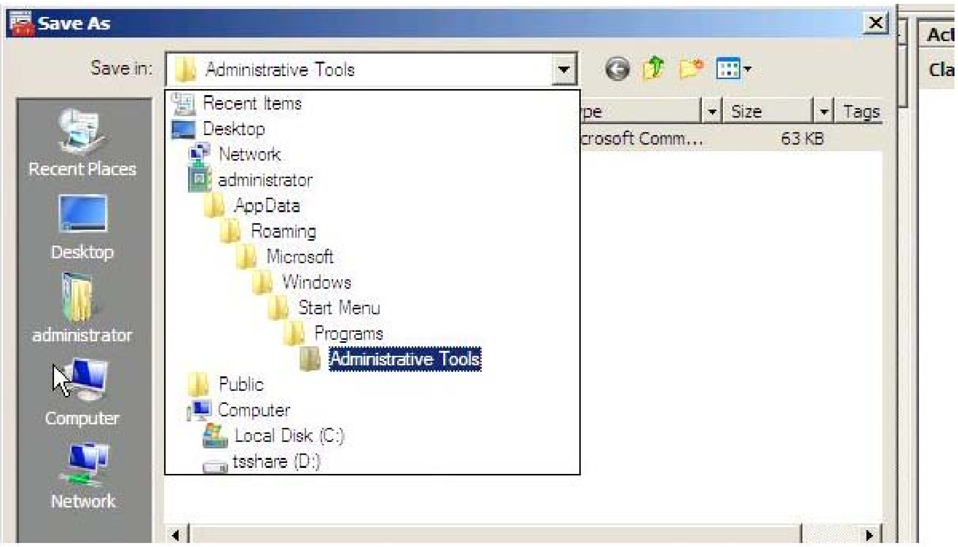


File name: Console1

Save as type: Microsoft Management Console Files (*.msc)

   b. Or, to save the snap-in to a location other than the Administrative Tools folder, in Save in, navigate to a location for the snap-in. In File name, type a name for the snap-in, and then click **Save**. *Figure I-7* shows the directory that displays.

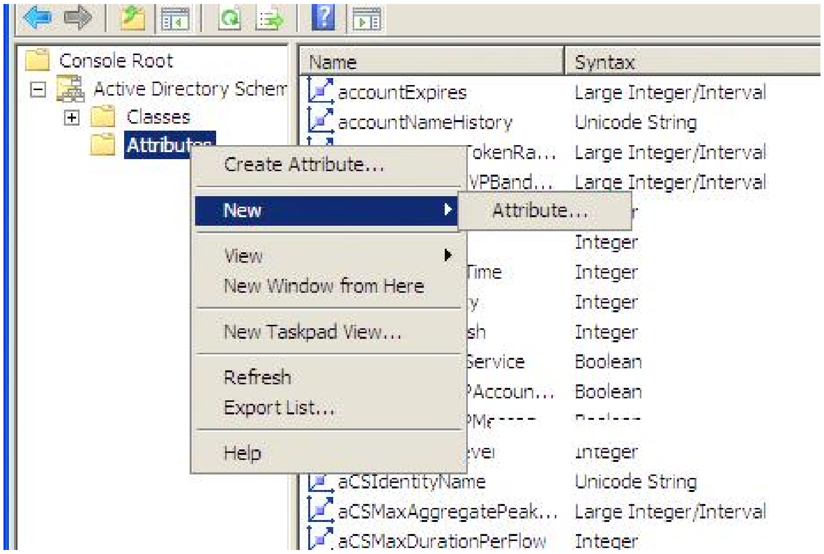
Figure I-7 Save As Window



Creating the SLC Schema Attribute

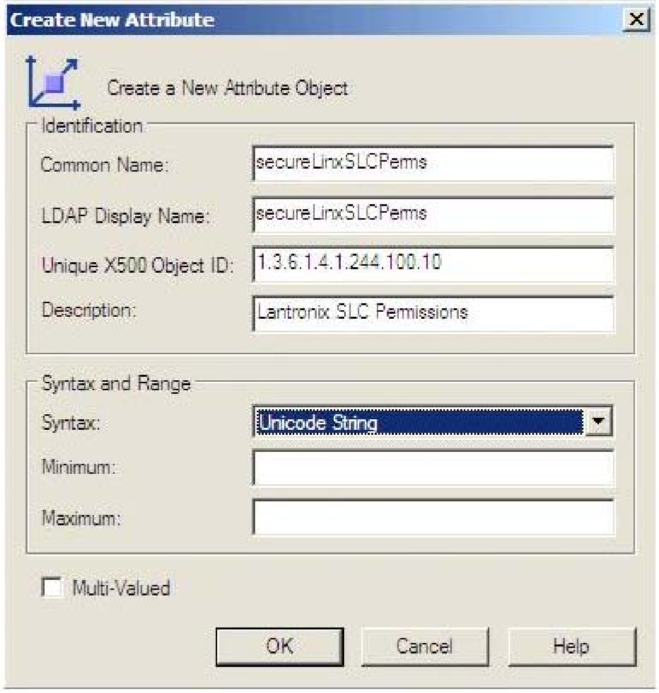
1. Once you have a saved Schema console, open it and right click on **Attributes**.
2. Mouse over **New** and left click on **Attribute**. *Figure I-8* shows the window that displays.

Figure I-8 New Attribute Window



3. Click **Continue** on the Warning screen.
4. For both the Common Name and LDAP Display Name, use **secureLinxSLCPerms** in exactly that form (case included). *Figure I-9* shows the window that displays.

Figure I-9 Create New Attribute Object Window



Create New Attribute

Create a New Attribute Object

Identification

Common Name: secureLinxSLCPerms

LDAP Display Name: secureLinxSLCPerms

Unique X500 Object ID: 1.3.6.1.4.1.244.100.10

Description: Lantronix SLC Permissions

Syntax and Range

Syntax: Unicode String

Minimum:

Maximum:

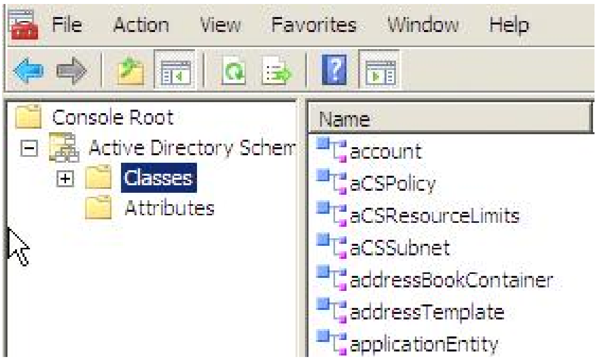
□ Multi-Valued

5. For the OID, enter **1.3.6.1.4.1.244.100.10**.
6. Enter anything for the description.
7. Change the Syntax: pull-down menu to Unicode String.
8. Click on OK.

Adding the Attribute to the Users Group in Windows

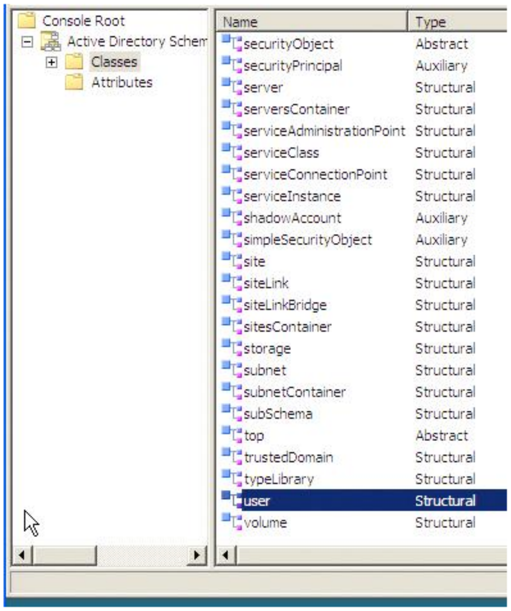
1. Highlight the Classes folder in the console tree on the left. *Figure I-10* shows the files that display.

Figure I-10 Classes Folder



2. In the right pane, scroll down to user. *Figure I-11* shows the window that displays.

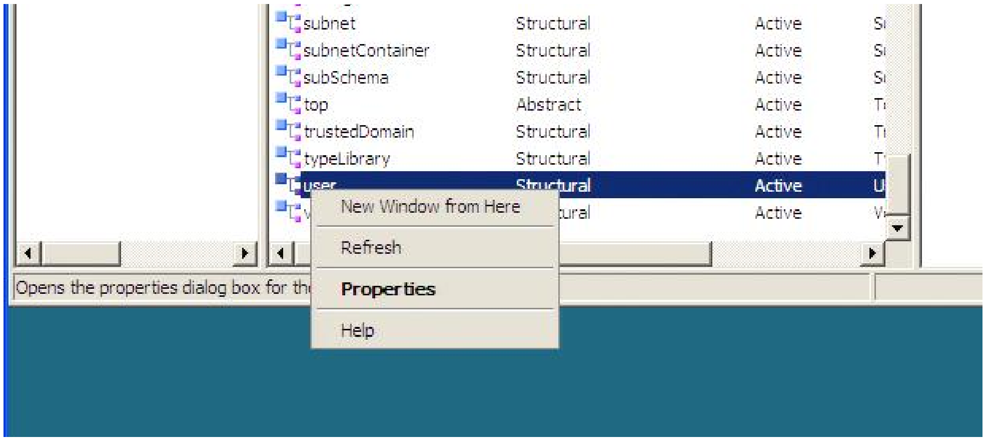
Figure I-11 User Class Window



Name	Type
securityObject	Abstract
securityPrincipal	Auxiliary
server	Structural
serversContainer	Structural
serviceAdministrationPoint	Structural
serviceClass	Structural
serviceConnectionPoint	Structural
serviceInstance	Structural
shadowAccount	Auxiliary
simpleSecurityObject	Auxiliary
site	Structural
siteLink	Structural
siteLinkBridge	Structural
sitesContainer	Structural
storage	Structural
subnet	Structural
subnetContainer	Structural
subSchema	Structural
top	Abstract
trustedDomain	Structural
typeLibrary	Structural
user	Structural
volume	Structural

3. Right click on a user and left click on **Properties**. *Figure I-12* shows the window that displays.

Figure I-12 Class User Properties Window

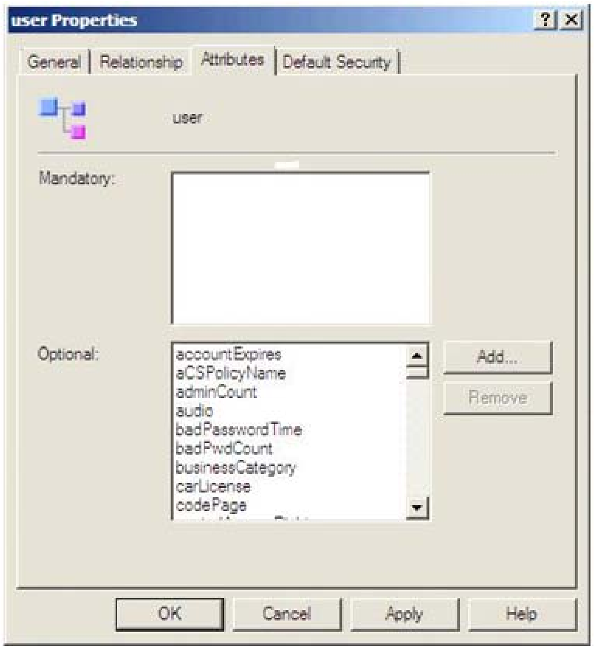


subnet	Structural	Active	S
subnetContainer	Structural	Active	S
subSchema	Structural	Active	S
top	Abstract	Active	T
trustedDomain	Structural	Active	T
typeLibrary	Structural	Active	T
user	Structural	Active	U
v	ural	Active	V

Opens the properties dialog box for th

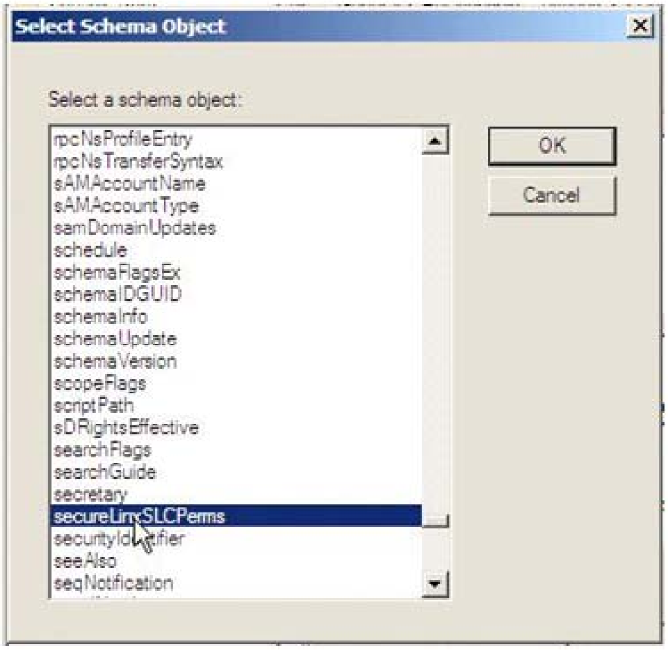
4. Under the **Attributes** tab, click on **Add**. *Figure I-13* shows the window that displays.

Figure I-13 User Properties Window



5. Find the **secureLinxSLCPerms** attribute, highlight it, and click on **OK**.

Figure I-14 Select Schema Object Window



6. Click on **OK** on the window underneath.

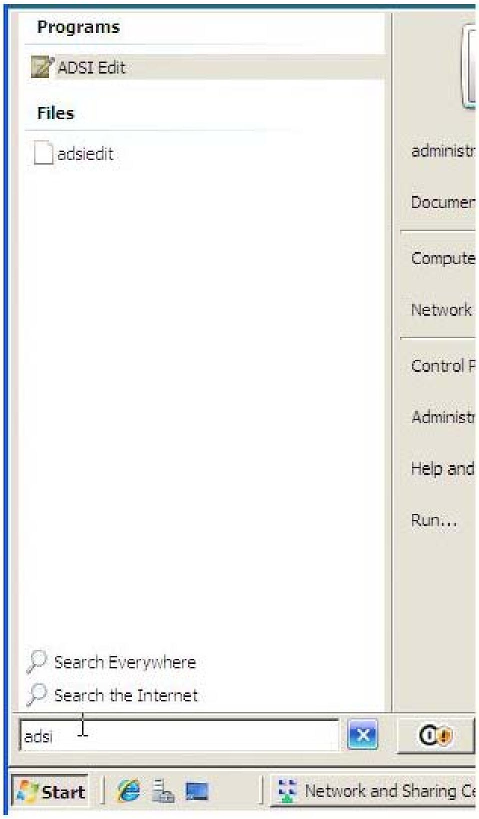
7. Click on **File** and click on **Save**.

8. Exit out of MMC.

Adding the Permissions to the Individual User

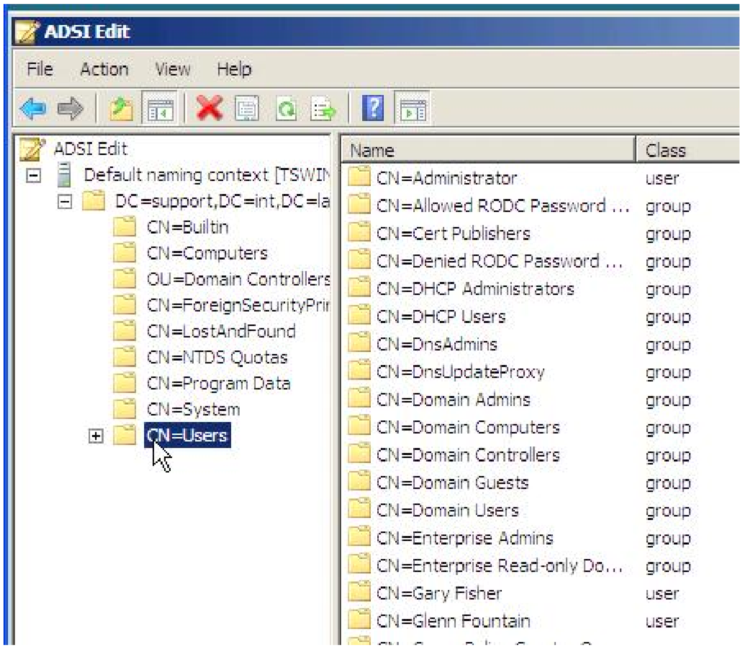
1. Open **ADSI Edit** (if you start typing adsi in the search line in Windows, it should find it). *Figure I-15* shows the window that displays.

Figure I-15 ADSI Edit Window



2. Expand the console tree until you get to the listing of users. *Figure I-16* shows the folder that displays.

Figure I-16 ADSI Edit Window, CN=Users Folder

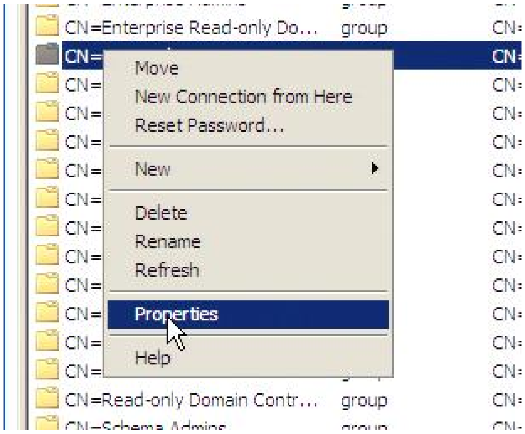


ADSI Edit
- Default naming context [TSWIN
  - DC=support,DC=int,DC=la
    - CN=Builtin
    - CN=Computers
    - OU=Domain Controllers
    - CN=ForeignSecurityPri
    - CN=LostAndFound
    - CN=NTDS Quotas
    - CN=Program Data
    - CN=System
    - CN=Users

Name	Class
CN=Administrator	user
CN=Allowed RODC Password ...	group
CN=Cert Publishers	group
CN=Denied RODC Password ...	group
CN=DHCP Administrators	group
CN=DHCP Users	group
CN=DnsAdmins	group
CN=DnsUpdateProxy	group
CN=Domain Admins	group
CN=Domain Computers	group
CN=Domain Controllers	group
CN=Domain Guests	group
CN=Domain Users	group
CN=Enterprise Admins	group
CN=Enterprise Read-only Do...	group
CN=Gary Fisher	user
CN=Glenn Fountain	user

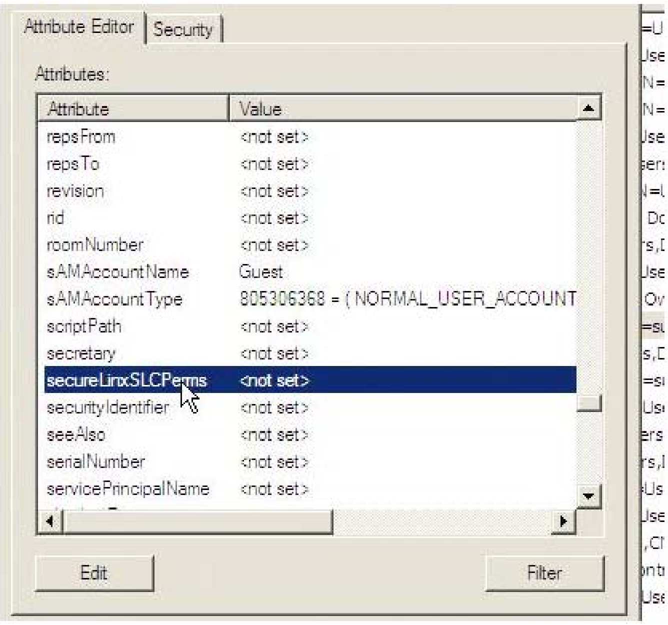
3. Right click on the user for whom you wish to configure permissions and left click on **Properties**. *Figure I-17* shows the Properties Window.

Figure I-17 Properties Window



4. Under the **Attribute Editor** tab, scroll down to **secureLinxSLCPerms**.
5. Highlight it and click on the **Edit** button. *Figure I-18* shows the window that displays.

Figure I-18 Attribute Editor Window



Attribute	Value
repsFrom	<not set>
repsTo	<not set>
revision	<not set>
rid	<not set>
roomNumber	<not set>
sAMAccountName	Guest
sAMAccountType	805306368 = (NORMAL_USER_ACCOUNT
scriptPath	<not set>
secretary	<not set>
secureLinxSLCPerms	<not set>
securityIdentifier	<not set>
seeAlso	<not set>
serialNumber	<not set>
servicePrincipalName	<not set>

Values to Use

The values that you can use in the **Value:** field that specify the user permissions are as follows:

- **rights**
- **data**
- **listen**
- **clear**
- **group**
- **escseq**
- **brkseq**
- **menu**

For **rights**, you can enable the following:

- **fa**: Full Administrative
- **nt**: Networking
- **sv**: Services
- **lu**: Local Users
- **ra**: Remote Authentication
- **dt**: Date/Time
- **sk**: SSH Keys
- **um**: User Menus

- **dp**: Device Ports Configuration
- **do**: Device Ports Operations
- **pc**: PC Cards
- **rs**: Reboot/Shutdown
- **fc**: Firmware/Configuration
- **dr**: Diagnostic Reports
- **sn**: Secure Lantronix Network
- **wb**: Web Access

For **data**, **listen**, and **clear**, you specify ports. Contiguous ports with a dash, non-contiguous with a comma, U1 for the USB port, or U and L for the upper and lower PC Card slots (1-5,8,11,U,L).

For **group**, the options are **admin**, **power**, and **default**, and any SLC or SLB custom group name. If a custom group name is specified and it matches a current SLC custom group name, any rights attribute will be ignored, and the custom group's rights (permissions) will be used instead. A group name with spaces cannot be specified.

For **escseq** and **brkseq**, you would specify what key sequence would escape you from a console session and send a break out the current session port, respectively. The default for each is "\x1bA" (esc-A) and "\x1bB" (esc-B), respectively. The \x in the default strings denotes that the next two characters are HEX. With the default, the \x is followed by 1b which equates to ESCAPE.

For **menu**, specify the name of a user menu configured on the SLC console manager that you would like to be displayed when that user logs in.

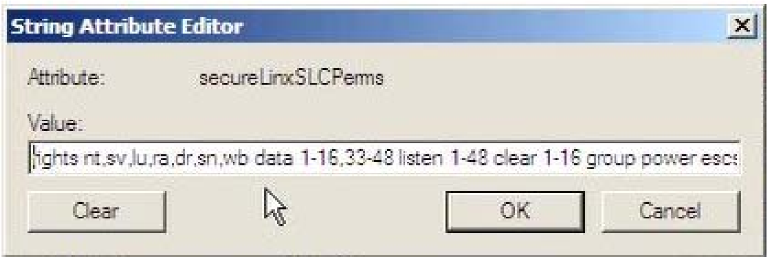
String Format

The string format is the parameter name, followed by a space, followed by the value or values of the parameters. Multiple values for a parameter would be connected with a comma (no spaces in between) or a dash in the case of device ports that are contiguous.

Example: rights nt,sv,lu,ra,dr,sn,wb data 1-16,33-48 listen 1-48 clear 1-16 group power escseq \x1bE brkseq \x1bZ menu bob

Enter the string, click **OK** and **OK** in the next window. *Figure I-19* shows the window that displays.

Figure I-19 String Attribute Editor Window



Attribute: secureLinxSLCPerms

Value:

rights nt,sv,lu,ra,dr,sn,wb data 1-16,33-48 listen 1-48 clear 1-16 group power esc